DVP-F11
RMT-D109E/D109O

SERVICE MANUAL

AEP Model
UK Model
E Model
Hong Kong Model
Singapore Model
Australian Model
Chinese Model

Self Diagnosis
Supported model

SPECIFICATIONS

CD/DVD player

Laser	Semiconductor laser
Signal format system	PAL/(NTSC)

Audio characteristics

Frequency response	DVD (PCM 96 kHz): 2 Hz to 44 kHz (±1 dB)* DVD (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB) CD: 2 Hz to 20 kHz (±0.5 dB)
Signal-to-noise ratio	More than 110 dB (LINE OUT (AUDIO 1, 2) connectors only)
Harmonic distortion	Less than 0.0025%
Dynamic range	More than 100 dB (DVD) More than 97 dB (CD)
Wow and flutter	Less than detected value (±0.001% W PEAK)

Outputs and inputs

	Jack type	Output level	Load impedance
LINE OUT (AUDIO1, 2)	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
OPTICAL	Optical output connector	–18 dBm	Wave length: 660 nm
COAXIAL	Phono jack	0.5 Vp-p	75 ohms terminated
LINE OUT (VIDEO1, 2)	Phono jacks	1.0 Vp-p	75 ohms, sync negative
LINE OUT (S-VIDEO1, 2)	4-pin mini DIN	Y: 1.0 Vp-p	75 ohms, sync negative
		C: 0.3 Vp-p (PAL) 0.286 Vp-p (NTSC)	75 ohms terminated
LINE OUT (WOOFER OUT)	Phono jacks	2 Vrms	Over 10 kilohms
PHONES	Phone jack	12 mW	32 ohms

General

Power requirements	DC 10.5 V
Power consumption	13 W
Dimensions (approx.)	215 × 60 × 314 mm (w/h/d) incl. projecting parts
Mass (approx.)	2.1 kg
Operating temperature	5°C to 35°C
Operating humidity	25% to 80%

AC power adaptor

Power requirements	220 to 240 V AC, 50/60 Hz
Power consumption	19 W
Output voltage	DC 10.5 V, 1.3 A in operating mode
Dimensions (approx.)	125 × 39 × 62 mm (w/h/d) excl. projecting parts
Mass (approx.)	235 g
Operating temperature	5°C to 35°C
Storage temperature	–20°C to +60°C

Supplied accessories

- Audio/Video connecting cord (1)
- S video cord (1)
- AC power adaptor AC-F11 (1)
- AC power cord (1)
- Remote commander (remote) RMT-D109O (1) (Except Hong Kong, Singapore and Chinese)
  Remote commander (remote) RMT-D109E (1) (Hong Kong, Singapore and Chinese)
- Size AA (R6) batteries (2)
- Stand (1)
- EURO AV adaptor (1) (Except Hong Kong, Singapore, Australian and Chinese)

* The signals from LINE OUT (AUDIO1, 2) connectors are measured. When you play the PCM sound tracks with 96 kHz sampling frequency, the output signals from the OPTICAL and COAXIAL connectors are converted to 48 kHz (sampling frequency).

Design and specifications are subject to change without notice.

CD/DVD PLAYER

MICROFILM

SONY®

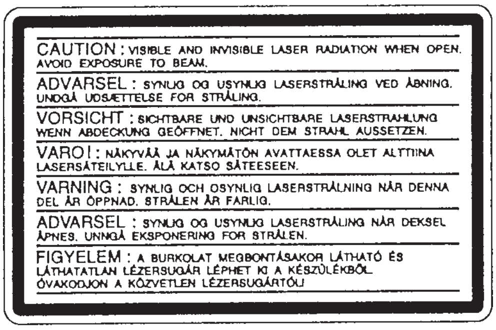
WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



CAUTION : VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.

ADVARSEL : SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.

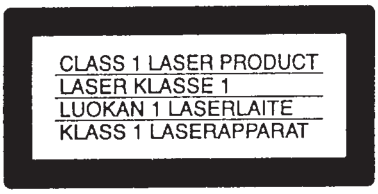
VORSICHT : SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

VARO! : NÄKYVÄÄ JA NÄKYMÄTÖN AVATTAESSA OLET ALTTIINA LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING : SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. STRÅLEN ÄR FARLIG.

ADVARSEL : SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.

FIGYELEM : A BURKOLAT MEGBONTÁSAKOR LÁTHATÓ ÉS LÁTHATATLAN LÉZERSUGÁR LÉPHET KI A KÉSZÜLÉKBŐL. ÓVAKODJON A KÖZVETLEN LÉZERSUGÁRTÓL!



CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

CLASS 3B LASER
LUOKAN 3B LASER
LASERKLASS 3B

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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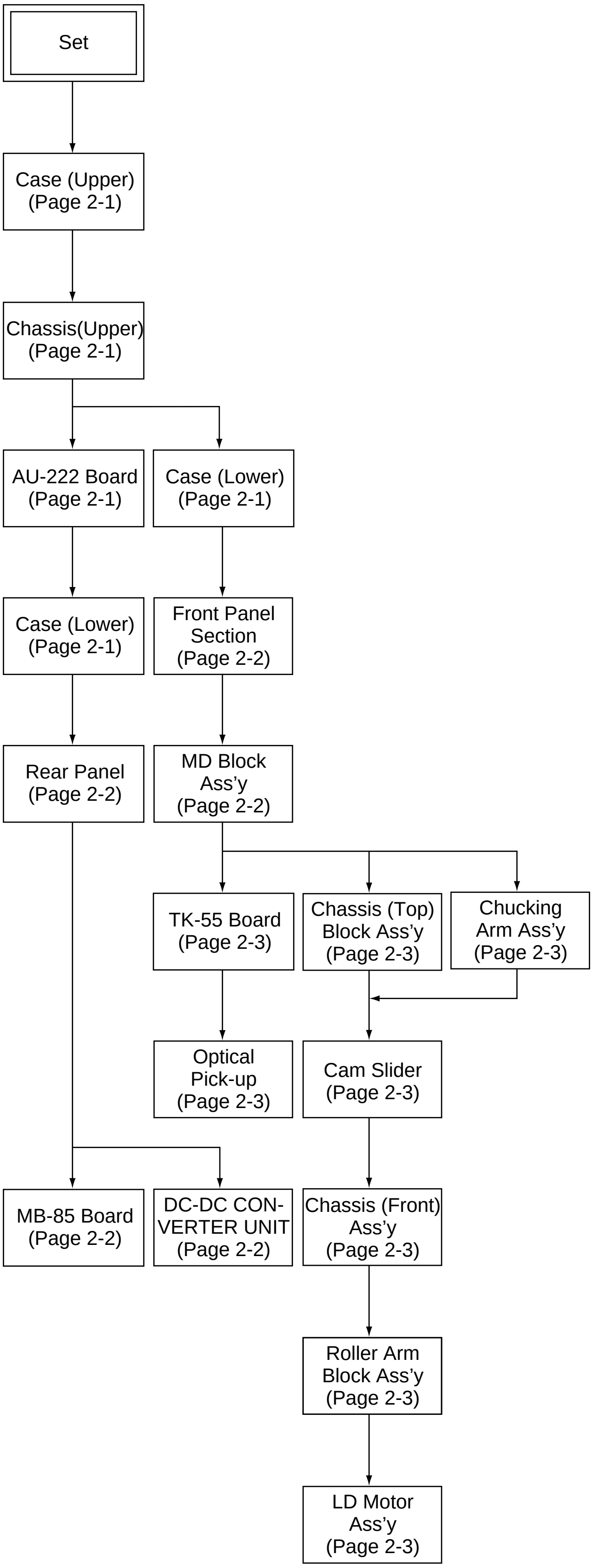
SERVICE NOTE

1. DISASSEMBLY

- This set can be disassembled in the order shown below.


Set
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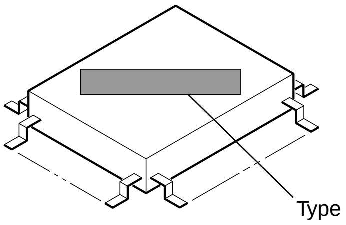
LD Motor Ass'y (Page 2-3)

Note on Replacing IC601 (IF CON) (FL-111 Board)

There are two types of IC601 (IF CON).

Version	Type (Part No.)
Ver. 1.00	M38B57MCH-E227FP (8-759-599-87)
Ver. 1.01	M38B57MCH-D233FP (8-759-658-36)

- Version checking method



When replacing the IC601, always check the version of old part and new part. If different, follow the "description of replacement" given below.

Old part (Ver.)	New part (Ver.)	Description of replacement
1.00	1.00	Replace as it is. (However, for the CED Model (serial No. 800001-800100), also replace the resistor R659 47 k (1-216-089-00) with 1.5 k (1-216-053-00), and further remove the resistors R653, 654, 661, 662, 663, 664.)
	1.01	Replace as it is. (However, for the CED Model (serial No. 800001-800100), also remove the resistors R653, 654, 661, 662, 663, 664.)
1.01	1.00	Also, replace resistor R659 47 k (1-216-089-00) with 1.5 k (1-216-053-00).
	1.01	Replace as it is.

SECTION 1
GENERAL

This section is extracted from instruction manual (3-867-780-11).

About This Manual

Conventions
- Instructions in this manual describe the controls on the player. You can also use the controls on the remote if they have the same or similar names as those on the player.
- The icons on the right are used in this manual:

Icon	Meaning
▯	Indicates that you can use only the remote to do the task.
💡	Indicates tips and hints for making the task easier.
DVD	Indicates the functions for DVD VIDEOs.
VIDEO CD	Indicates the functions for VIDEO CDs.
CD	Indicates the functions for Audio CDs.

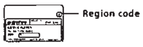
This Player Can Play the Following Discs

	DVD VIDEOs		VIDEO CDs		Audio CDs	
Disc logo	DVD VIDEO		COMPACT disc DIGITAL VIDEO		COMPACT disc DIGITAL AUDIO TEXT	
Contents	Audio + Video		Audio + Video		Audio	
Disc size	12 cm	8 cm	12 cm	8 cm	12 cm	8 cm (CD single)
Play time	About 4 h (for single-sided DVD)/ about 8 h (for double-sided DVD)	About 80 min. (for single-sided DVD)/ about 160 min. (for double-sided DVD)	74 min.	20 min.	74 min.	20 min.

"DVD VIDEO" logo is a trademark.

When you play an NTSC disc, this player outputs the video signal in the NTSC system only. In this case, if your TV is a PAL system mode, the picture becomes noisy.

Region code of DVDs you can play on this unit



Your DVD player has a region code printed on the back of the unit and will only play DVDs that are labeled with identical region codes.

DVDs labeled ALL will be also played on this unit.

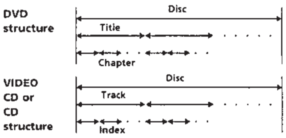
If you try to play any other DVD, the message "Playing this disc prohibited by area limits." will appear on the TV screen.

Depending on the DVD, no region code indication may be labeled even though playing the DVD is prohibited by the area limits.

Note on playback operations of DVDs and VIDEO CDs
Some playback operations of DVDs and VIDEO CDs may be intentionally fixed by software producers. Since this player plays DVDs and VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs or VIDEO CDs.

Terms for discs

- Title
  The longest sections of a picture or a music piece on a DVD; a movie, etc., for a picture piece on a video software; or an album, etc., for a music piece on an audio software. Each title is assigned a title number enabling you to locate the title you want.
- Chapter
  Sections of a picture or a music piece that are smaller than titles. A title is composed of several chapters. Each chapter is assigned a chapter number enabling you to locate the chapter you want. Depending on the disc, no chapters may be recorded.
- Track
  Sections of a picture or a music piece on a VIDEO CD or a CD. Each track is assigned a track number enabling you to locate the track you want.



- Index (CD) / Video Index (VIDEO CD)
  A number that divides a track into sections to easily locate the point you want on a VIDEO CD or a CD. Depending on the disc, no indexes may be recorded.
- Scene
  On a VIDEO CD with PBC functions, the menu screens, moving pictures and still pictures are divided into sections called "scenes." Each scene is assigned a scene number enabling you to locate the scene you want.

Note on PBC (Playback Control) (VIDEO CDs)
This player conforms to Ver. 1.1 and Ver. 2.0 of VIDEO CD standards. You can enjoy two kinds of playback according to the disc type.

Disc type	You can
VIDEO CDs without PBC functions (Ver. 1.1 discs)	Enjoy video playback (moving pictures) as well as music.
VIDEO CDs with PBC functions (Ver. 2.0 discs)	Play interactive software using menu screens displayed on the TV screen (PBC Playback), in addition to the video playback functions of Ver 1.1 discs. Moreover, you can play high-resolution still pictures, if they are included on the disc.

Discs that the player cannot play
The player cannot play discs other than the ones listed in the table on page 4. CD-R, CD-ROMs including PHOTO CDs, data sections in CD-EXTRAs, DVD-ROMs, DVD-Audio, HD (high density) layer of "Super Audio CD," etc., cannot be played.

When playing DTS*-encoded CDs, excessive noise will be heard from the analog stereo outputs. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo outputs of the DVD player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel DTS Digital Surround™ decoder system must be connected to the digital output of the DVD player.

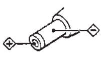
This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

* "DTS" is a trademark of Digital Theater Systems, Inc.

Precautions

On safety
- Caution – The use of optical instruments with this product will increase eye hazard.
- Should any solid object or liquid fall into the cabinet, unplug the player and have it checked by qualified personnel before operating it any further.
- Do not put any foreign objects in the DC IN 10.5 V (external power input) jack.

On AC power adaptor and AC power cord
- Use only the supplied AC power adaptor. Do not use any other AC power adaptor. It may cause a malfunction.
  Polarity of the plug



- If the AC power adaptor causes interference to the radio reception, move it away from the radio.
- Do not touch the AC power adaptor with wet hands.
- The player is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the player itself has been turned off.
- If you are not going to use the player for a long time, be sure to disconnect the player from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.
- Should the AC power cord (mains lead) need to be changed, have it done at a qualified service shop only.

On placement
- Place the player in a location with adequate ventilation to prevent heat build-up in the player.
- Do not place the player and the AC power adaptor on a soft surface such as a rug that might block the ventilation holes on the bottom.
- Do not place the player in a location near heat sources, or in a place subject to direct sunlight, excessive dust or mechanical shock.
- Do not put any heavy object on top of the player. The player may be damaged.

On operation
- If the player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the player. Should this occur, the player may not operate properly. In this case, remove the disc and leave the player turned on for about half an hour until the moisture evaporates.

On adjusting volume
- Do not turn up the volume while listening to a portion with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level portion is played.

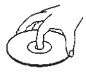
On cleaning
- Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

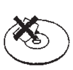
If you have any questions or problems concerning your player, please consult your nearest Sony dealer.

IMPORTANT NOTICE
Caution: The enclosed DVD player is capable of holding a still video image or On screen display image on your television screen indefinitely. If you leave the still video image or On screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Projection televisions are very susceptible.

Notes on Discs

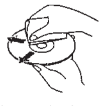
On handling discs
- Do not use irregularly shaped CDs such as heart- or star-shaped CD as they may cause the player to malfunction.
- To keep the disc clean, handle the disc by its edge. Do not touch the surface.
- Do not stick paper or tape on the disc.
  If there is glue (or a similar substance) on the disc, remove the glue completely before using the disc.





- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as there can be considerable rise in temperature inside the car.
- After playing, store the disc in its case.

On cleaning
- Before playing, clean the disc with a cleaning cloth. Wipe the disc from the center out.



- Do not use solvents such as benzine, thinner, commercially available cleaners or anti-static spray intended for vinyl LPs.

Getting Started

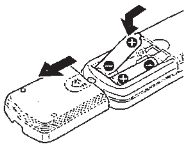
This section describes how to hook up the CD/DVD player to a TV (with audio/video input jacks) and/or an AV receiver (amplifier). You cannot connect this player to a TV which does not have a video input connector. Be sure to turn off the power of each component before making the connections.

Unpacking

Check that you have the following items:
- Audio/video connecting cord (1)
- S video cord (1)
- AC power adaptor AC-F11 (1)
- AC power cord (1)
- Remote commander (remote) RMT-D109O (1)
- R6 (size AA) batteries (2)
- Stand (1)
- EURO AV adaptor (1, for the models available in Europe only)

Inserting batteries into the remote

You can control the player using the supplied remote. Insert two R6 (size AA) batteries by matching the + and – on the batteries. When using the remote, point it at the remote sensor ⊡ on the player.



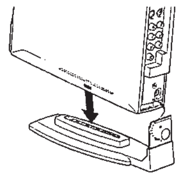
You can control TVs and AV receivers using the supplied remote
See page 54.

Notes
- Do not leave the remote in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you will not use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

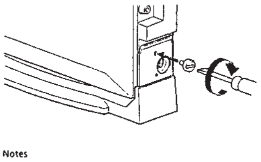
Using the player in a vertical position

If you want to use the player in a vertical position, attach the supplied stand.

1 Align the groove of the player and the projection of the stand.



2 Fasten the stand with the supplied screw.



Notes
- When you place the player in a horizontal position, remove the stand.
- To move the player, hold the player itself. If you hold the stand, the stand may break

TV Hookups

This connection is for listening to the sound through TV speakers (2ch – L, R). Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "NONE" in the setup display (page 53).

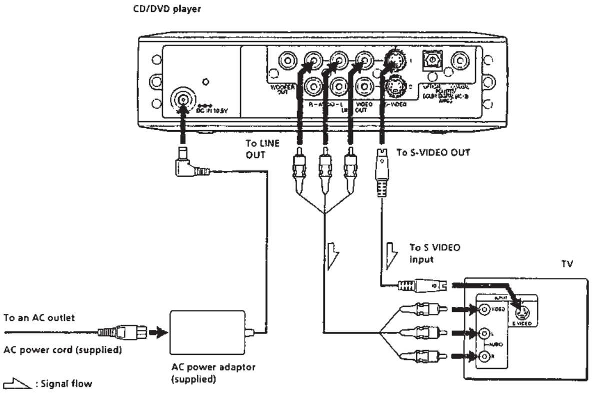
Required cords

Audio/video connecting cord (supplied) (1)

Yellow
White (L)
Red (R)
Yellow
White (L)
Red (R)

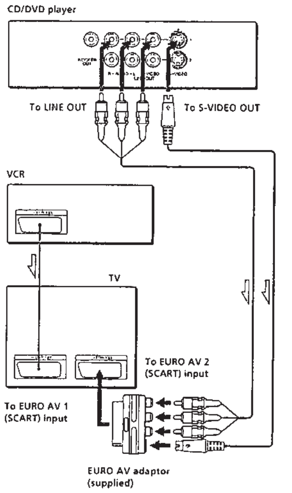
S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Yellow (video) to Yellow, Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.
If your TV has an S video input connector, connect the component via the S-VIDEO connector using the S video cord. You will get a better picture.
Refer to the instructions supplied with the TV to be connected.

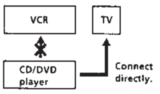


If your TV has a EURO AV (SCART) connector

Attach the supplied EURO AV adaptor to your TV, then connect the DVD player and the TV using the supplied audio/video connecting cord. If your TV has two EURO AV (SCART) connector, you may connect a VCR as shown below.
When you connect the S video cord, do not connect the yellow (video) plug of the audio/video connecting cord.


CD/DVD player
To LINE OUT
To S-VIDEO OUT
VCR
TV
To EURO AV 2 (SCART) input
To EURO AV 1 (SCART) input
EURO AV adaptor (supplied)

Notes
- Refer to the instructions supplied with the component to be connected.
- Do not connect this player to a video deck. If you view the pictures on your TV after making the connections shown below, a picture noise may appear.



- Depending on the TV or receiver (amplifier), sound distortion may occur because the audio output level is high. In this case, set "AUDIO ATT" in "AUDIO SETUP" to "ON" in the setup display. For details, see page 50.
- If you cannot view the pictures from a VCR through this player which is connected to a TV with RGB, set ⊸1 to ⊸(Audio/Video) on your TV. When you select ⊸(RGB), the TV cannot receive the signal from the VCR.

Setups for the player

Some setups are necessary for the player depending on the TV or other components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- **To connect the player to a wide-screen TV**
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "16:9" (default setting). For details, see page 46.
- **To connect the player to a normal TV**
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "4:3 LETTER BOX" or "4:3 PAN SCAN."
  For details, see page 46.

This player conforms to the PAL color system. When you play a disc recorded in the NTSC color system, the player outputs the video signal or the setup display etc. in the NTSC color system and the picture may not appear on the TV screen. In this case, eject the disc.

Receiver (Amplifier) Hookups

This connection is for listening to the sound through speakers connected to a receiver. Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "NONE" in the setup display (page 53).

You can enjoy surround when connecting front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (Virtual Enhanced Surround). For details, see page 35.

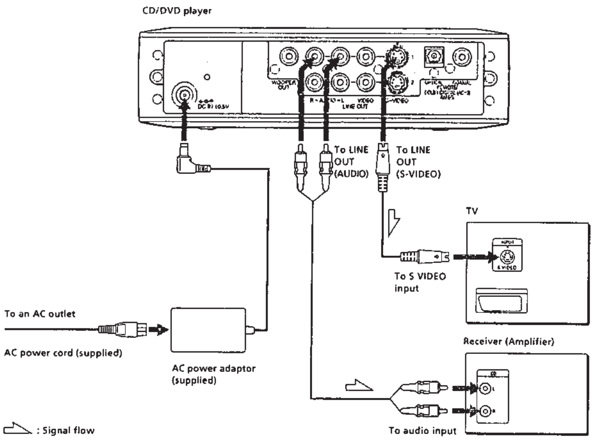
Required cords

Audio connecting cord (not supplied) (1)

White (L)
Red (R)
White (L)
Red (R)

S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.

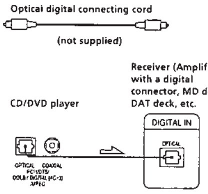

CD/DVD player
To LINE OUT (AUDIO)
To LINE OUT (S-VIDEO)
TV
To S VIDEO input
To an AC outlet
AC power cord (supplied)
AC power adaptor (supplied)
Receiver (Amplifier)
To audio input
: Signal flow

Note
You cannot enjoy the picture with S video signal if your TV is not conformed to the S video signal. When your TV does not have S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 10.
Refer to the instructions supplied with your TV.

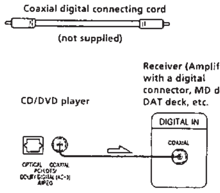
If you have a digital component such as a receiver (amplifier) with a digital connector, DAT or MD

Connect the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied).

■ When using an optical digital connecting cord


Optical digital connecting cord
(not supplied)
Receiver (Amplifier) with a digital connector, MD deck, DAT deck, etc.
CD/DVD player
DIGITAL IN
OPTICAL
OPTICAL
COAXIAL
PCM/DTS/
DOLBY DIGITAL (AC-3)
MPEG

■ When using a coaxial digital connecting cord


Coaxial digital connecting cord
(not supplied)
Receiver (Amplifier) with a digital connector, MD deck, DAT deck, etc.
CD/DVD player
DIGITAL IN
COAXIAL
OPTICAL
COAXIAL
PCM/DTS/
DOLBY DIGITAL (AC-3)
MPEG

Notes
- Refer to the instructions supplied with the component to be connected.
- You cannot make digital audio recordings of discs recorded in multi-channel surround format directly using an MD deck or DAT deck.

When you make the connections above, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL," "MPEG" to "MPEG" and "DTS" to "ON." If you do, a loud noise will suddenly come out from the speakers, affecting your ears or causing the speakers to be damaged.

If you have a digital component with a built-in DTS, Dolby Digital or MPEG decoder
You can enjoy multichannel surround sound by connecting the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). For details on hookups and settings, see page 15.

Setups for the player

Some setups are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- **To listen to the sound through speakers connected to a receiver (amplifier) having a digital connector or to output the sound to a digital component such as a DAT or MD deck**
  When you play a DVD, set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DOLBY DIGITAL" to "D-PCM," "MPEG" to "PCM" and "DTS" to "OFF" in the setup display (page 51). These are the default settings.

2.1 Channel Surround Hookups

This connection is for listening to the sound through the left and right speakers of the TV, or those connected to a receiver and the subwoofer. You can enjoy rich bass frequencies by connecting a subwoofer. Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "YES" in the setup display (page 53). Then set "FRONT SPEAKER SIZE" to "TV" when you use the TV's speakers, or to "LARGE," "MIDDLE" or "SMALL" when you use the speakers connected to the receiver.

You can enjoy surround when connecting front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (Virtual Enhanced Surround). For details, see page 35.

Required cords

Audio connecting cord (not supplied) (1)

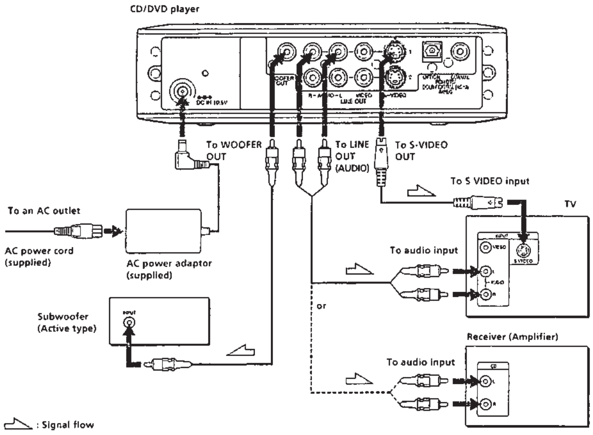
White (L)
Red (R)
White (L)
Red (R)

S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.

Monaural audio cord (not supplied) (1)
One for a subwoofer

Black
Black


CD/DVD player
To WOOFER OUT
To LINE OUT (AUDIO)
To S-VIDEO OUT
To S VIDEO input
TV
To an AC outlet
AC power cord (supplied)
AC power adaptor (supplied)
To audio input
Subwoofer (Active type)
or
Receiver (Amplifier)
To audio input
: Signal flow

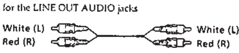
Note
You cannot enjoy the picture with S video signal if your TV is not conformed to the S video signal. When your TV does not have S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 10.
Refer to the instructions supplied with your TV.

5.1 Channel Surround Hookups

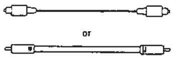
With DVDs which contain DTS, Dolby* Digital or MPEG AUDIO sound, you can enjoy the sorround sound while producing the effect of being in a movie theater or a concert hall, using a digital component with a built-in DTS, Dolby Digital or MPEG decoder (not supplied). The player outputs the surround sound signals from the OPTICAL and COAXIAL connectors.
Using a receiver (amplifier) having the OPTICAL or COAXIAL connector and the 5 (+1) speakers, you can enjoy more real audio presence in the comfort of your own home.

Required cords

Audio cords (not supplied)
One for the LINE OUT AUDIO jacks


White (L)
Red (R)
White (L)
Red (R)

Optical or coaxial digital cord (not supplied)
One for the OPTICAL or COAXIAL jack



S video cord (supplied)
One for the S-VIDEO jack

Connect the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). You do not need to connect both of these cords. See the figure on the next page.

Notes
- Do not connect the power cord to an AC outlet or press the POWER switch before completing all connections.
- Refer to the instructions supplied with the component to be connected.
- The cord connectors should be fully inserted into the jacks. Loose connection may cause hum and noise.
- Jacks and plugs of the connecting cords are color-coded as follows:
  Red jacks and plugs: Right audio channel
  White jacks and plugs: Left audio channel

Setups for the player

Some setups are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- **When you play a DVD that is recorded in DTS format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DTS" to "ON" in the setup display (page 51).
- **When you play a DVD that is recorded in Dolby Digital format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DOLBY DIGITAL" to "DOLBY DIGITAL" in the setup display (page 51).
- **When you play a DVD that is recorded in MPEG format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "MPEG" to "MPEG" in the setup display (page 51).

Notes
- Refer to the instructions supplied with the component to be connected.
- **When you do not connect an audio component with a built-in DTS decoder, do not set "DTS" to "ON."**
- **When you do not connect an audio component with a built-in DOLBY DIGITAL decoder, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL."**
- **When you do not connect an audio component with a built-in MPEG decoder, do not set "MPEG" to "MPEG."**

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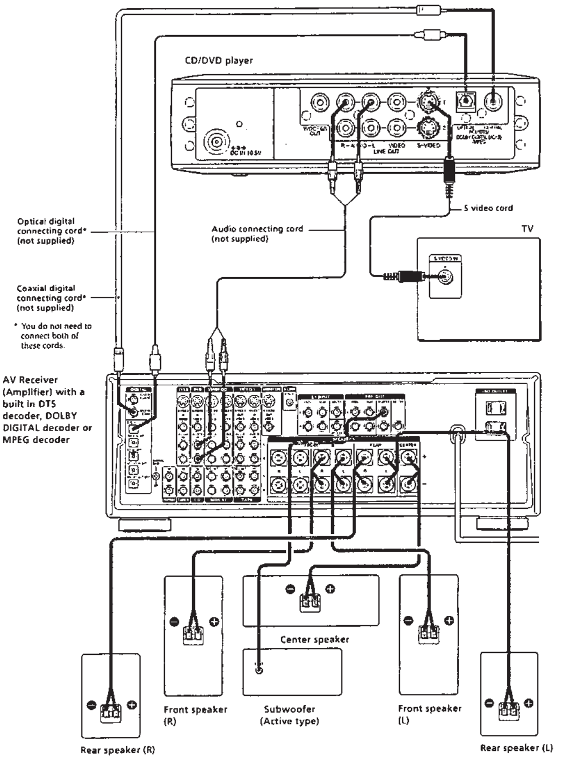
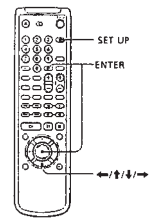
Confidential Unpublished Works. ©1992-1997 Dolby Laboratories, Inc. All rights reserved.

5.1 Channel Surround Hookups

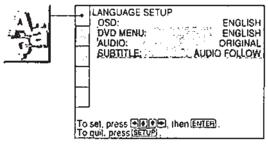

CD/DVD player
S video cord
TV
Optical digital connecting cord* (not supplied)
Audio connecting cord (not supplied)
Coaxial digital connecting cord* (not supplied)
* You do not need to connect both of these cords.
AV Receiver (Amplifier) with a built in DTS decoder, DOLBY DIGITAL decoder or MPEG decoder
Center speaker
Front speaker (R)
Subwoofer (Active type)
Front speaker (L)
Rear speaker (R)
Rear speaker (L)

Selecting the Language for On-Screen Display

You can select the language for the setup display, the Control Menu display or the messages displayed on the screen. Default setting is "ENGLISH."

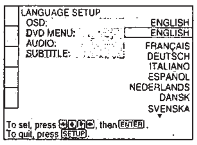

SET UP
ENTER
←/↑/↓/→

1 Press SET UP and select "LANGUAGE SETUP" using ↑/↓, and then press ENTER.



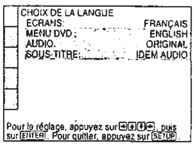
LANGUAGE SETUP
OSD: ENGLISH
DVD MENU: ENGLISH
AUDIO: ORIGINAL
SUBTITLE: AUDIO FOLLOW
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

2 Select "OSD" using ↑/↓, then press → or ENTER.



LANGUAGE SETUP
OSD: ENGLISH
DVD MENU: ENGLISH
AUDIO:
SUBTITLE:
ENGLISH
FRANÇAIS
DEUTSCH
ITALIANO
ESPAÑOL
NEDERLANDS
DANSK
SVENSKA
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

3 Select "FRANÇAIS" using ↑/↓, then press ENTER.



CHOIX DE LA LANGUE
ECRANS: FRANÇAIS
MENU DVD: ENGLISH
AUDIO: ORIGINAL
SOUS-TITRE: IDEM AUDIO
Pour le réglage, appuyez sur ←↑↓→, puis sur ENTER. Pour quitter, appuyez sur SETUP.

To cancel using the setup display on the way
Press SET UP.

Note
The languages you can select are the ones displayed in Step 2. For details, see page 45.

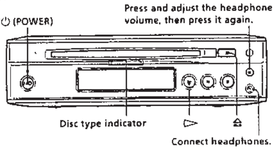
Playing Discs

This chapter describes how to play a DVD/CD/VIDEO CD.

This player conforms to the PAL color system. When you play a disc recorded in the NTSC color system, the player outputs the video signal or the setup display etc. in the NTSC color system and the picture may not appear on the TV screen. In this case, eject the disc.

Playing Discs DVD VIDEO CD CD

Depending on the DVD or VIDEO CD, some operations may be different or restricted. Refer to the instructions supplied with your disc.

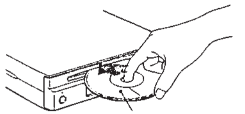

I/⏻ (POWER)
Press and adjust the headphone volume, then press it again.
Disc type indicator
▷
⏏
Connect headphones.

1 **Make settings on your TV.**
Turn on the TV and select the video input so that you can view the pictures from this player.

When using a receiver (amplifier)
Turn on the receiver (amplifier) and select the appropriate position so that you can listen to the sound from this player.

2 **Press I/⏻ (POWER) to turn on the player.**
The indicator (red) above the I/⏻ (POWER) button changes to green and the front panel display lights up.

3 **Insert the disc.**
The corresponding disc type indicator lights up.


With the playback side facing down

4 **Press ▷.**
The player starts playback (Continuous Play). Adjust the volume on the TV or the receiver (amplifier).

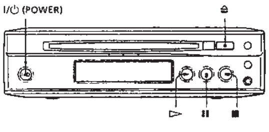
After following Step 4

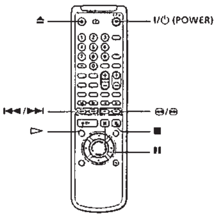
■ When playing a DVD
A DVD menu or title menu may appear on the TV screen (see page 22).

■ When playing a VIDEO CD
The menu screen may appear on the TV screen depending on the VIDEO CD. You can play the disc interactively, following the instructions on the menu screen. (PBC Playback, see page 23.)

💡 You can turn on the player using the remote
Press I/⏻ (POWER) when the indicator above the I/⏻ (POWER) button on the front panel is lit in red.

Notes
- If you leave the player or the remote in pause or stop mode for 15 minutes, the screen saver image appears automatically. To make the screen saver image go away, press ▷. (If you want to set the screen saver function to off, see page 46.)
- The indicator above the I/⏻ (POWER) button lights up in red when the power is turned off.
- If you don't operate the player or the remote for more than 30 minutes when a disc is not being played, the power is automatically turned off. (Auto Power Off function)
- When you insert an 8-cm disc, insert the disc slowly at the center of the disc slot. If you cannot eject the disc, consult your nearest Sony dealer.



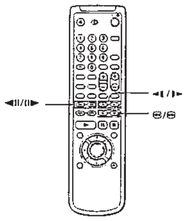


To	Operation
Stop	Press ■.
Pause	Press II.
Resume play after pause	Press II or ▷.
Go to the next chapter, track or scene in continuous play mode	Press ▶▶I on the remote.
Go back to the preceding chapter, track or scene in continuous play mode	Press I◀◀ on the remote
Locate a point while monitoring the picture (Scan)	Press ⊟ or ⊞ on the remote. When you find the point you want, press ▷ to return to the normal speed.
Stop play and remove the disc	Press ⏏.

You can play discs in various modes such as Program Play using the on-screen menu (Control Menu). For operations of Control Menu, see page 26.

Searching for a Particular Point on a Disc DVD VIDEO CD CD

You can locate a particular point on a disc by monitoring the picture, playing back slowly or playing frame by frame.



Note
Depending on the DVD/VIDEO CD, you may not be able to do some of the operations described.

Locating a point quickly by playing a disc fast forward or fast reverse (Speed scan)

Press ⊖ or ⊕ while playing a disc. When you find the point, press ▷ to return to the normal speed.
Each time you press the ⊖ or ⊕ button during Speed scan, the playback speed changes. Two speeds are available. With each press, the indication changes as follows:

1▶▶ ↔ 2▶▶ (playback direction)
1◀◀ ↔ 2◀◀ (opposite direction)

The playback speed of 2▶▶/2◀◀ is faster than 1▶▶/1◀◀.

Locating a point slowly by observing the screen (Slow-motion play) DVD VIDEO CD

You can use this function only for DVDs or VIDEO CDs.
Press ◀I or I▶ while playing a disc. When you find the point, press ▷ to return to the normal speed.
Each time you press the ◀I or I▶ button during Slow-motion play, the playback speed changes. Two speeds are available. With each press, the indication changes as follows:

1I▶ ↔ 2I▶ (playback direction)
1◀I ↔ 2◀I (opposite direction – DVD only)

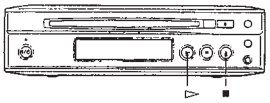
The playback speed of 2I▶ /2◀I is slower than 1I▶ /1◀I.

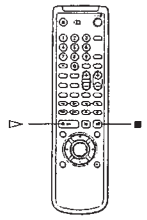
Playing a disc frame by frame DVD VIDEO CD

You can use this function only for DVDs or VIDEO CDs.
Press ◀II or II▶ while playing a disc. To return to normal playback, press ▷.

Resuming Playback from the Point Where You Stopped the Disc (Resume Play) DVD VIDEO CD CD

The player stores the point where you stopped the disc and if "RESUME" appears on the front panel display. You can resume playback from that point.
As long as you do not eject the disc, Resume Play is available even if you turn the power off.





1 **While playing a disc, press ■ to stop playback.**
"RESUME" appears in the front panel display and "When playing next time, disc restarts from point you stopped." appears on the TV screen.
If "RESUME" does not appear, Resume Play is not available.

2 **Press ▷.**
The player starts playback from the point where you stopped the disc in Step 1.

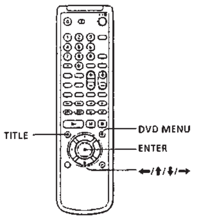
To play from the beginning of the disc
When the playing time appears on the front panel display before you start playing, press ■ to reset the playing time, then press ▷.

Notes
- Resume Play may not be available depending on the DVD.
- Resume Play is not available in Shuffle or Program Play mode.
- Depending on where you stopped the disc, the player may resume playback from a different point.
- The point where you stopped playing is cleared when:
  - you eject the disc
  - you disconnect the AC power cord
  - you change the play mode
  - you start playback after selecting a title, chapter or track
  - you change the settings of "TV TYPE" in "SCREEN SETUP" in the setup display
  - you change the settings of "PARENTAL CONTROL" in "CUSTOM SETUP" in the setup display

Using the Menu for Each DVD DVD

Using the title menu

A DVD is divided into long sections of a picture or a music piece called "titles." When you play a DVD which contains several titles, you can select the title you want using the title menu.



1 **Press TITLE.**
The title menu appears on the TV screen. The contents of the menu vary from disc to disc.

2 **Press ←/↑/↓/→ to select the title you want to play.**
Depending on the disc, you can use the number buttons to select the title.

3 **Press ENTER.**
The player starts playing the selected title.

Notes
- Depending on the DVD, you may not be able to select the title.
- Depending on the DVD, a "title menu" may simply be called a "menu" or "title" in the instructions supplied with the disc. "Press ENTER." may also be expressed as "Press SELECT."

Using the DVD menu

Some DVDs allow you to select the disc contents using the menu. When you play these DVDs, you can select the language for the subtitles, the language for the sound, etc., using the DVD menu.

1 **Press DVD MENU.**
The DVD menu appears on the TV screen. The contents of the menu vary from disc to disc.

2 **Press ←/↑/↓/→ to select the item you want to change.**
Depending on the disc, you can use the number buttons to select the item.

3 **To change other items, repeat Step 2.**

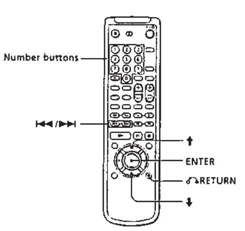
4 **Press ENTER.**

If you want to select the language for the DVD menu
Change the setting using "LANGUAGE SETUP" in the setup display. For details, see page 45.

Note
Depending on the DVD, a "DVD menu" may simply be called a "menu" in the instructions supplied with the disc.

Playing VIDEO CDs with PBC Functions (PBC Playback) VIDEO CD

When playing VIDEO CDs with PBC functions (Ver. 2.0 discs), you can enjoy simple interactive operations, operations with search functions, etc.
PBC Playback allows you to play VIDEO CDs interactively, following the menu screen on the TV screen.
On this player, you can use the number buttons, ENTER, I◀◀, ▶▶I, ↑/↓ and ↶RETURN during PBC Playback.



1 **Start playing a VIDEO CD with PBC functions, following Steps 1 to 4 in "Playing Discs" on page 18.**

2 **Press the number button of the item you want.**

3 **Press ENTER.**

4 **Follow the instructions on the menu screen for interactive operations.**
Refer to the instructions supplied with the disc, as the operating procedure may differ according to the VIDEO CD.

Going back to the menu screen
Press ↶RETURN, I◀◀ or ▶▶I.

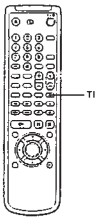
When playing VIDEO CDs with PBC functions
PBC playback starts automatically.

To cancel PBC playback of a VIDEO CD with PBC functions and play the disc in Continuous Play mode
There are two ways.
- Before you start playing, select the track you want using I◀◀ or ▶▶I, then press ENTER or ▷.
- Before you start playing, select the track number using the number buttons on the remote, then press ENTER or ▷.
  "Play without PBC" appears on the TV screen and the player starts Continuous Play. You cannot play still pictures such as a menu screen.
  To return to PBC playback, press ■ twice then press ▷.

Note
Depending on the VIDEO CD, "Press ENTER." in Step 3 may be expressed as "Press SELECT." in the instructions supplied with the disc.

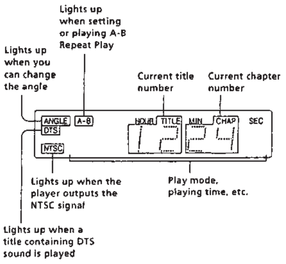
Using the Front Panel Display DVD VIDEO CD CD

You can check information about the disc, such as the total number of the titles or the tracks or remaining time, using the front panel display.



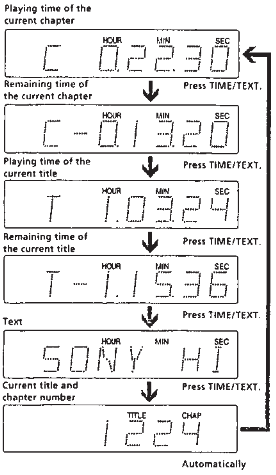
When playing back a DVD DVD

Display information while playing the disc


Lights up when setting or playing A-B Repeat Play
Lights up when you can change the angle
Current title number
Current chapter number
ANGLE
A-B
DTS
NTSC
HOUR
TITLE
MIN
CHAP
SEC
1 2 2 4
Lights up when the player outputs the NTSC signal
Play mode, playing time, etc.
Lights up when a title containing DTS sound is played

Checking the remaining time

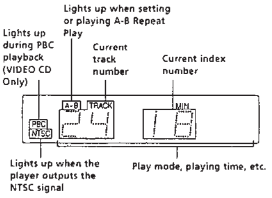
Press TIME/TEXT.
Each time you press TIME/TEXT while playing the disc, the display changes as shown in the following chart.


Playing time of the current chapter
HOUR MIN SEC
C 0.22.30
Remaining time of the current chapter
Press TIME/TEXT.
C - 0.13.20
Playing time of the current title
Press TIME/TEXT.
T 1.03.24
Remaining time of the current title
Press TIME/TEXT.
T - 1.15.36
Text
Press TIME/TEXT.
SONY HI
Current title and chapter number
Press TIME/TEXT.
TITLE CHAP
12 24
Automatically

Notes
- Depending on the DVD, the chapter number or time may not appear or you may not be able to change the front panel display.
- While you are doing Shuffle Play or Program Play, the playing time of the title and the remaining time of the title are not displayed.

When playing back a CD/VIDEO CD VIDEO CD CD

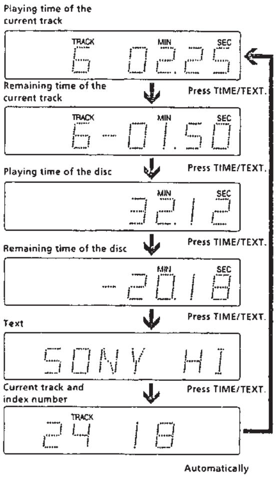
Display information while playing a disc


Lights up when setting or playing A-B Repeat Play
Lights up during PBC playback (VIDEO CD Only)
Current track number
Current index number
A-B
TRACK
MIN
PBC
NTSC
24 18
Lights up when the player outputs the NTSC signal
Play mode, playing time, etc.

When playing VIDEO CDs with PBC functions
The current scene number is displayed instead of the current track number and the current index number. In this case, the front panel display does not change when you press TIME/TEXT. If the TEXT is recorded in the disc, the front panel display changes to Text display when you press TIME/TEXT (see page 31).

Checking the remaining time

Press TIME/TEXT.
Each time you press TIME/TEXT while playing a disc, the display changes as shown in the following chart.


Playing time of the current track
TRACK MIN SEC
6 02.25
Remaining time of the current track
Press TIME/TEXT.
6 - 01.50
Playing time of the disc
Press TIME/TEXT.
32.12
Remaining time of the disc
Press TIME/TEXT.
- 20.18
Text
Press TIME/TEXT.
SONY HI
Current track and index number
Press TIME/TEXT.
24 18
Automatically

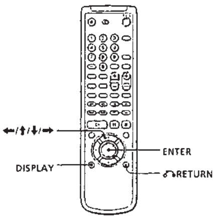
Note
While you are doing Shuffle Play, Program Play, or PBC playback, the playing time of the disc and the remaining time of the disc are not displayed.

Using Various Functions with the Control Menu

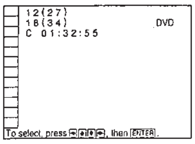
This chapter describes how to play discs in various modes and how to use the convenient features of the on-screen menu (Control Menu).

Using the Control Menu Display DVD VIDEO CD CD

Using the Control Menu display, you can select the start point, play in a order you like, change the angles, set for Digital Cinema Sound, etc.
The items are different depending on the kind of disc.
For details on each Control Menu display item, see pages 29 to 41.

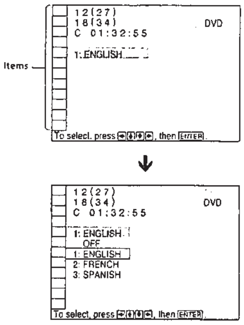

←/↑/↓/→
ENTER
DISPLAY
RETURN

1 Press DISPLAY to show the Control Menu display on the TV screen.



12(27)
18(34)
C 01:32:55
DVD
To select, press ←↑↓→, then ENTER.

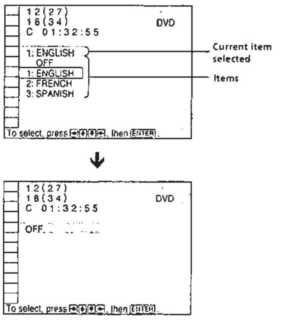
2 Select the item you want using ↑/↓, then press → or ENTER.



12(27)
18(34)
C 01:32:55
DVD
1: ENGLISH
To select, press ←↑↓→, then ENTER.

12(27)
18(34)
C 01:32:55
DVD
1: ENGLISH
OFF
1: ENGLISH
2: FRENCH
3: SPANISH
To select, press ←↑↓→, then ENTER.

3 Select the item you want using ↑/↓, then press ENTER.


Current item selected
Items

12(27)
18(34)
C 01:32:55
DVD
1: ENGLISH
OFF
1: ENGLISH
2: FRENCH
3: SPANISH
To select, press ←↑↓→, then ENTER.

12(27)
18(34)
C 01:32:55
DVD
OFF
To select, press ←↑↓→, then ENTER.

Note
Some Control Menu display items require operations other than selecting the setting. For details on these items, see the relevant pages.

To cancel using the Control Menu display on the way
Press RETURN.

To display other items
Each time you press DISPLAY, the Control Menu display changes as follows:

→Control Menu display
↓
ADVANCED display (See page 41.)
↓
Control Menu display off

You can display some items using the remote
Some items can be displayed by pressing the button of the remote. In this case, only the item you selected is displayed. For the item and operations using the remote, see the pages of each item.

Control Menu Item List

TITLE (DVD only) (page 29)
CHAPTER (DVD only) (page 29)
TRACK (VIDEO CD/CD only) (page 29)
INDEX (VIDEO CD/CD only) (page 29)
SCENE (VIDEO CD during PBC playback only) (page 29)
You can search by selecting the title/chapter/track/index.

TIME/TEXT (page 30, 31)
You can check the playing time and remaining time of the current title/chapter/track and the total remaining time of the disc.
You can search by inputting the time code.
You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.

AUDIO (page 32)
With DVDs recorded with multilingual sounds, you can select the language you want while playing the DVD.
With multiplex CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers.

SUBTITLE (DVD only) (page 33)
With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want.

ANGLE (DVD only) (page 34)
With DVDs on which various angles (multi-angles) are recorded, you can change the angles on the scene for which multi-angles are recorded.

VES (page 35)
Select the mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.
Even if you connect only front speakers, Virtual Enhanced Surround (VES) lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers.
You can feel the more effective 3D sound when you connect a receiver (amplifier) with digital (optical or coaxial) input, 2 front speakers, 2 rear speakers, 1 center speaker and 1 subwoofer.

PROGRAM (page 36)
You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc to create your own program.

SHUFFLE (page 38)
You can have the player "shuffle" titles, chapters or tracks and play them in a random order. The playing order may differ from the previous "shuffling."

REPEAT (page 39)
You can play all the titles/tracks on a disc or a single title/chapter/track repeatedly.

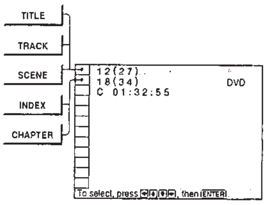
A-B REPEAT (page 39)
You can play a specific portion of a title, chapter, or track repeatedly.

ADVANCED (DVD only) (page 41)
You can check the play information about the bit rate, bit rate history or the position where the disc is played (layer).

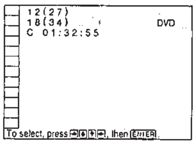
Searching for the Title/Chapter/Track/Index/Scene

DVD VIDEO CD CD

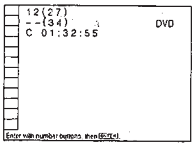
You can search by selecting the title/chapter/track/index/scene.
Select "TITLE," " CHAPTER," " TRACK", "INDEX" or "SCENE" after pressing DISPLAY.
When you play back a DVD, "TITLE" and "CHAPTER" are displayed.
When you play back a VIDEO CD/CD, "TRACK" and "INDEX" are displayed. When you play back a VIDEO CD with PBC functions, "SCENE" is displayed.



1 **Select "TITLE," "CHAPTER," "TRACK" or "INDEX" using ↑/↓.**
"✻✻(✻✻)" is highlighted. (✻✻ means optional number in this manual.) Number in parentheses indicate the total number of titles, chapters, tracks or indexes.



2 **Press → or ENTER.**
"✻✻(✻✻)" is changed to "— — (✻✻)."



3 **Select the number of the title, chapter, track or index you want to search for using the number buttons, then press ENTER.**
The player starts searching. To cancel the number, press CLEAR before pressing ENTER.

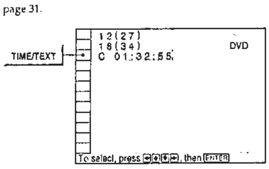
To cancel selecting
Press ↶RETURN.

Notes
- The number of titles, chapters or tracks displayed is that of the titles, chapters or tracks recorded on a disc.
- The index numbers are not displayed during PBC playback of VIDEO CDs.

Checking the Playing Time and Remaining Time

DVD VIDEO CD CD

You can check the playing time and remaining time of the current title/chapter/track and the total remaining time of the disc.
Press DISPLAY. Then press TIME/TEXT on the remote to change the time information.
You can also check the DVD TEXT and CD TEXT. See page 31.



When playing a DVD
■TIME/TEXT
- C ✻✻:✻✻:✻✻ : Playing time of the current chapter
- C -✻✻:✻✻:✻✻ : Remaining time of the current chapter
- T ✻✻:✻✻:✻✻ : Playing time of the current title
- T -✻✻:✻✻:✻✻ : Remaining time of the current title

When playing a VIDEO CD (during PBC playback)
■TIME/TEXT
- ✻✻:✻✻ : Playing time of the current scene

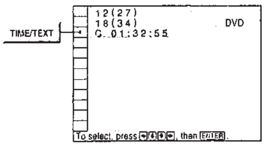
When playing a VIDEO CD (in Continuous play) or CD
■TIME/TEXT
- T ✻✻:✻✻ : Playing time of the current track
- T -✻✻:✻✻ : Remaining time of the current track
- D ✻✻:✻✻ : Playing time of the current disc
- D -✻✻:✻✻ : Remaining time of the current disc

You can display "TIME/TEXT" display quickly
Press TIME/TEXT on the remote. Each time you press the button, the time information changes.

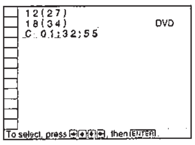
Selecting a Start Point Using the Time Code

DVD

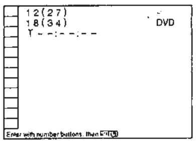
You can search by inputting the time code.
Select "TIME/TEXT" after pressing DISPLAY.
The time code corresponds to the approximate actual playing time. For example, to search for a scene 2 hours 30 minutes 20 seconds past the beginning, input 2:30:20.



1 **Select "C ✻✻:✻✻:✻✻" (playing time of the current chapter).**



2 **Press → or ENTER.**
Time code changes to "T --:--:--."



3 **Input the time code using the number buttons, then press ENTER.**
The player starts searching. To cancel the number, press CLEAR before pressing ENTER.

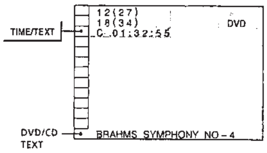
To cancel inputting
Press ↶RETURN.

Note
When you input the time code, input the playing time of the title.

Checking the Information of the Disc

DVD VIDEO CD CD

You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.
DVD TEXT and CD TEXT are information recorded on the disc which you cannot change.
Press DISPLAY. Then press TIME/TEXT on the remote until DVD/CD TEXT is displayed.
The information is displayed at the bottom of the display.

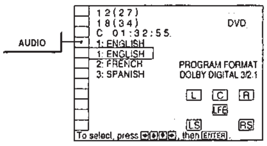


You can display "TIME/TEXT" display quickly
Press TIME/TEXT on the remote. To display DVD/CD TEXT, press TIME/TEXT until DVD/CD TEXT is displayed.

Note
The DVD TEXT only in English is displayed.

Changing the Sounds DVD VIDEO CD CD

With DVDs recorded with multilingual sounds, you can select the language you want while playing the DVD.
With multiplex CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. In this case, the sound loses the stereo effect. For example, with a disc containing a song, the right channel may output the vocals and the left channel may output the instrumental. If you only want to hear the instrumental, you can select the left channel and hear it from both speakers.
Select "AUDIO" after pressing DISPLAY.


AUDIO
1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
1: ENGLISH
1: ENGLISH
2: FRENCH
3: SPANISH
PROGRAM FORMAT
DOLBY DIGITAL 3/2.1
L C R
LFE
LS RS
To select, press ◀▲▼▶, then ENTER.

■AUDIO

When playing a DVD

Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they represent the language code. Select the language code from the list on page 63.

When playing a VIDEO CD or a CD

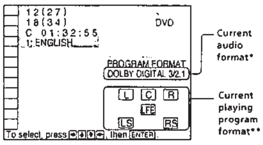
- STEREO : The standard stereo sound
- 1/L : The sound of the left channel (monaural)
- 2/R : The sound of the right channel (monaural)

You can display "AUDIO" display quickly
Press AUDIO on the remote.

Notes
- Depending on the DVD, you may not be able to change the languages even if multilingual sounds are recorded on the DVD.
- While playing the CD/VIDEO CD, the standard stereo playback will be resumed when:
  - you eject the disc
  - you turn the power off
- While playing the DVD, the sound may be changed when:
  - you eject the disc
  - you change the title
- If the language is displayed as a 4 digit number, refer to the language code list on page 63.

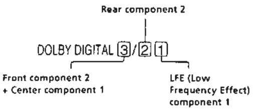
Displaying the audio information of the disc DVD

When you select "AUDIO," the playing channels are displayed on the screen.
In Dolby Digital format, the signals from monaural to 5.1 channels can be recorded on a DVD. Depending on the DVD the number of the recorded channels may be different.


1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
1: ENGLISH
PROGRAM FORMAT
DOLBY DIGITAL 3/2.1
Current audio format*
L C R
LFE
LS RS
Current playing program format**
To select, press ◀▲▼▶, then ENTER.

* "PCM," "DTS," "DOLBY DIGITAL" or "MPEG" is displayed. In "DOLBY DIGITAL" case, the channels in the playing track are displayed by number as follows:

The case of Dolby Digital 5.1 ch:

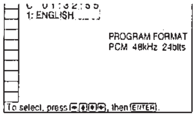

Rear component 2
DOLBY DIGITAL 3/2 1
Front component 2
+ Center component 1
LFE (Low Frequency Effect) component 1

** The letters in the program format display mean the following:

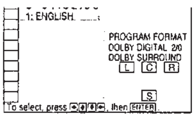
L:	Front (L)
R:	Front (R)
C:	Center (monaural)
LS:	Rear (L)
RS:	Rear (R)
S:	Rear (monaural) – the rear component of the Dolby Surround processed stereo signal and the Dolby Digital signal.
LFE:	– LFE (Low Frequency Effect)

The display examples are as follows:

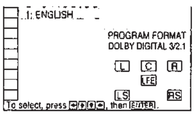
- PCM (stereo)


C 01:32:55
1: ENGLISH
PROGRAM FORMAT
PCM 48kHz 24bits
To select, press ◀▲▼▶, then ENTER.

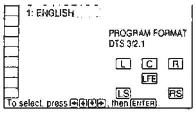
- Dolby Surround


1: ENGLISH
PROGRAM FORMAT
DOLBY DIGITAL 2/0
DOLBY SURROUND
L C R
S
To select, press ◀▲▼▶, then ENTER.

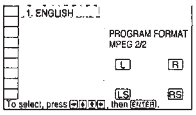
- Dolby Digital 5.1ch


1: ENGLISH
PROGRAM FORMAT
DOLBY DIGITAL 3/2.1
L C R
LFE
LS RS
To select, press ◀▲▼▶, then ENTER.

- DTS


1: ENGLISH
PROGRAM FORMAT
DTS 3/2.1
L C R
LFE
LS RS
To select, press ◀▲▼▶, then ENTER.

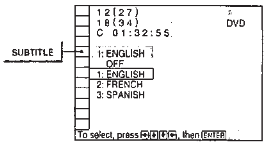
- MPEG


1: ENGLISH
PROGRAM FORMAT
MPEG 2/2
L R
LS RS
To select, press ◀▲▼▶, then ENTER.

You can find Dolby Surround-encoded software by looking at the packaging
Use discs with the DOLBY DIGITAL logo. In order to enjoy Dolby Digital playback you must use discs bearing this logo.

Displaying the Subtitles DVD

With DVDs on which subtitles are recorded, you can turn the subtitles on and off whenever you want while playing the DVD.
With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want. For example, you can select the language you want to master and turn the subtitles on for better understanding.
Select "SUBTITLE" after pressing DISPLAY.


SUBTITLE
1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
1: ENGLISH
OFF
1: ENGLISH
2: FRENCH
3: SPANISH
To select, press ◀▲▼▶, then ENTER.

■SUBTITLE

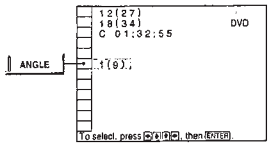
Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they indicate the language code. Select the language code from the list on page 63.

You can display the "SUBTITLE" display quickly
Press SUBTITLE on the remote. Each time you press the button, the item changes.

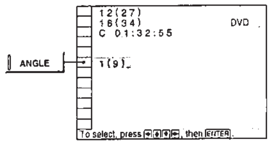
Notes
- When playing a DVD on which no subtitles are recorded, no subtitles appear.
- Depending on the DVD, you may not be able to turn the subtitles on even if they are recorded on it.
- Depending on the DVD, you may not be able to turn the subtitles off.
- If the language is displayed as a 4-digit number, refer to the language code list on page 63.
- The type and number of languages for subtitles vary from disc to disc.
- Depending on the DVD, you may not be able to change the subtitles even if multilingual subtitles are recorded on it.
- While playing the DVD, the subtitle may change when:
  - you eject the disc
  - you change the title

Changing the Angles DVD

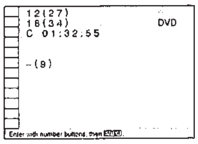
With DVDs on which various angles (multi-angles) for a scene are recorded, you can change the angles. For example, while playing a scene of a train in motion, you can display the view from either the front of the train, the left window of the train or from the right window without having the train's movement interrupted.
Select "ANGLE" after pressing DISPLAY. When the angles can be changed, the indicator of the "ANGLE" lights in green.


ANGLE
1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
1 (9)
To select, press ◀▲▼▶, then ENTER.

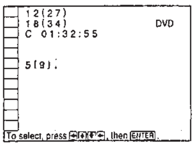
1 Select "ANGLE."


ANGLE
1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
1 (9)
To select, press ◀▲▼▶, then ENTER.

2 Press ➡.
The number of the angle changes to "–." The number in parentheses indicates the total number of angles.


1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
– (9)
Enter with number buttons, then ENTER.

3 Select the number of the angles using the number buttons or ↑/↓, then press ENTER.
The angle is changed to the selected angle.


1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
5 (9)
To select, press ◀▲▼▶, then ENTER.

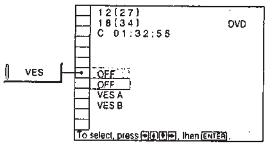
Notes
- The number of angles varies from disc to disc or from scene to scene. The number of angles that can be changed on a scene is that of angles recorded for that scene.
- Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

You can specify the angle beforehand
Specify the angle when "ANGLE" is not displayed on the front panel display. When a scene on which multi-angles are recorded comes, the angle is automatically selected.

You can select the angle directly
Press ANGLE on the remote. Each time you press the button, the angle changes.

Setting for Digital Cinema Sound DVD VIDEO CD CD

Select the mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.
Even if you connect only front speakers, Virtual Enhanced Surround lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers.
You can feel the more effective 3D sound when you connect a receiver (amplifier) with digital (optical or coaxial) input, 2 front speakers, 2 rear speakers, 1 center speaker and 1 subwoofer.
Select "VES" after pressing DISPLAY. When you select the item except "OFF," the indicator of the "VES" lights in green.


VES
1 2 (2 7)
1 8 (3 4)
DVD
C 01:32:55
OFF
OFF
VES A
VES B
To select, press ◀▲▼▶, then ENTER.

■VES

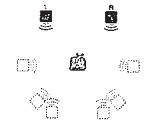
Select the desired item. For details on each item, see "Effects of each item."
- OFF
- VES A*
- VES B*

* These settings also effect the output from the LINE OUT (AUDIO) connectors.

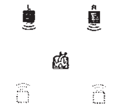
Effects of each item

OFF
Outputs 2-channel signals for stereo sound of the CD. 5-channel signals for Dolby Digital sound of the DVD are mixed down to 2-channel to be output.

VES (Virtual Enhanced Surround) A
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.



VES (Virtual Enhanced Surround) B
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.

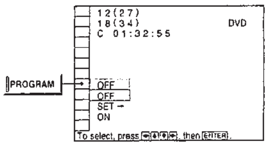


Notes
- The surround effect will be heard only when you set "DOLBY DIGITAL" to "D-PCM," and "MPEG" to "PCM" in "AUDIO SETUP."
- Some discs do not have rear sound. In this case, you cannot get the 3D surround effect.
- When you select an item, the sound cuts off for a moment.
- When the playing signal does not contain the surround component, the effects may be difficult to hear even if you select "VES A" or "VES B."
- Set the front speakers to form an equilateral triangle including the listening position, or the effects may be difficult to hear even if you select "VES A" or "VES B."
- When you connect a subwoofer, you can also hear the sound from the subwoofer.
- When you select "VES A" or "VES B," set the surround settings of the connected units such as the amplifier to OFF.

Creating Your Own Program (Program Play)

DVD VIDEO CD CD

You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc and create your own program. One program can be restored in the player and contain up to 99 titles, chapters and tracks.
Select "PROGRAM" after pressing DISPLAY. When you select "ON," the indicator of the "PROGRAM" lights in green.

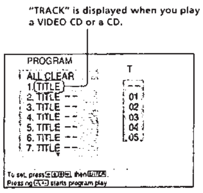

12(27)
18(34)
C 01:32:55
DVD
PROGRAM
OFF
OFF
SET →
ON
To select, press ←/↑/↓/→, then ENTER.

■PROGRAM
- OFF: plays normal.
- SET➡: allows you to create your own program.
- ON: plays Program Play.

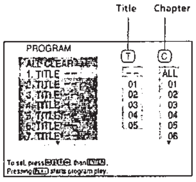
Creating the program

1 Select "SET➡" in "PROGRAM."
The programming display appears.

"TRACK" is displayed when you play a VIDEO CD or a CD.

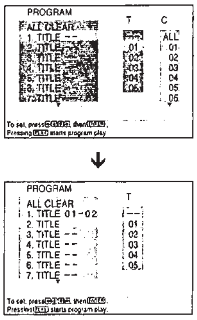

PROGRAM
T
ALL CLEAR
1. TITLE
2. TITLE --
3. TITLE --
4. TITLE --
5. TITLE --
6. TITLE --
7. TITLE --
01
02
03
04
05
To set, press ←/↑/↓/→, then ENTER.
Pressing PLAY starts program play

2 Press ➡.
"01" is highlighted. It is ready to set the first title or track for program.


Title
Chapter
PROGRAM
T
C
ALL CLEAR
1. TITLE --
2. TITLE
3. TITLE
4. TITLE
5. TITLE
6. TITLE
7. TITLE
ALL
01
02
03
04
05
06
To set, press ←/↑/↓/→, then ENTER.
Pressing PLAY starts program play.

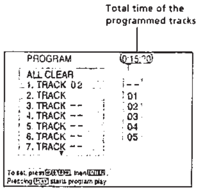
3 Select the title, chapter or track you want to program using ↑/↓, then press ENTER.
For example, select title or track 2.
(You can also use the number buttons and ENTER button to select. In this case, the selected number is displayed on the screen.)

■When playing a DVD
When both titles and chapters are recorded on the disc, select the title, then the chapter.


PROGRAM
T
C
ALL CLEAR
1. TITLE --
2. TITLE
3. TITLE
4. TITLE
5. TITLE
6. TITLE
7. TITLE
ALL
01
02
03
04
05
06
To set, press ←/↑/↓/→, then ENTER.
Pressing PLAY starts program play
PROGRAM
T
ALL CLEAR
1. TITLE 01-02
2. TITLE
3. TITLE --
4. TITLE --
5. TITLE --
6. TITLE --
7. TITLE --
01
02
03
04
05
To set, press ←/↑/↓/→, then ENTER.
Pressing PLAY starts program play.

■When playing a VIDEO CD or CD
Select the track you want to program.

Total time of the programmed tracks


PROGRAM
0:15:30
ALL CLEAR
1. TRACK 02
2. TRACK
3. TRACK --
4. TRACK --
5. TRACK --
6. TRACK --
7. TRACK --
01
02
03
04
05
To set, press ←/↑/↓/→, then ENTER.
Pressing PLAY starts program play

4 To program other titles, chapters or tracks, repeat Step 3.
The programmed titles, chapters or tracks are displayed from 2 in order.

5 Press ▷ to start Program Play.

To cancel Program Play
Press CLEAR.

To cancel programming
Press PROGRAM.

To change programming
1 In Step 2, select the program number of the title, chapter or track you want to change using ↑/↓.
2 Follow Step 3 for new programming.

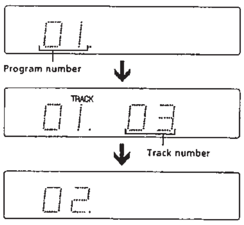
To cancel the programmed order
To cancel all the titles, chapters or tracks in the programmed order, select "ALL CLEAR" in Step 2.
To cancel the selected program, select the program using ↑/↓ in Step 2 then press CLEAR, or select "- -" in Step 3 then press ENTER.

The program remains even after the Program Play ends
When you press ▷, you can play the same program again.

You can do Repeat Play or Shuffle Play of the programmed titles, chapters or tracks
During Program Play, press REPEAT or SHUFFLE. Or set "REPEAT" or "SHUFFLE" to "ON" in the Control Menu display.

You can display "PROGRAM" display quickly
Press PROGRAM on the remote.

You can select discs, titles, chapters and tracks for the program by looking at the front panel display
You can program by looking at the front panel display instead of using the programming display on the TV screen.
When you select Track 3 in a VIDEO CD for Program 1, the front panel display will appear as follows:

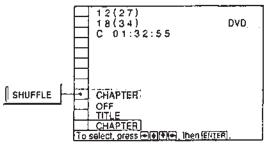

01.
Program number
TRACK
01. 03
Track number
02.

Notes
- The program is canceled when:
  - you eject the disc
  - you turn the power off
- You may not be able to do Program Play depending on the DVD.
- While you are doing PBC playback, you cannot set a program unless you stop playback once.

Playing in Random Order (Shuffle Play)

DVD VIDEO CD CD

You can have the player "shuffle" titles or tracks and play them in a random order. The playing order may differ from the previous "shuffling."
Select "SHUFFLE" after pressing DISPLAY. When you do not select "OFF," the indicator of the "SHUFFLE" lights in green.


12(27)
18(34)
C 01:32:55
DVD
SHUFFLE
CHAPTER
OFF
TITLE
CHAPTER
To select, press ←/↑/↓/→, then ENTER.

■SHUFFLE
Selects the setting of Shuffle Play.

When playing a DVD and when Program Play is set to OFF
- OFF: does not play a disc in random order.
- TITLE: has the player "shuffle" titles and play in a random order.
- CHAPTER: has the player "shuffle" chapters and play in a random order.

When playing a VIDEO CD, CD or DVD (when Program Play is set to ON)
- OFF: does not play a disc in random order.
- ON: has the player "shuffle" titles or tracks and play in a random order.

When playing a VIDEO CD or CD (when Program Play is set to OFF)
- OFF: does not play a disc in random order.
- TRACK: has the player "shuffle" tracks and play in a random order.

To cancel Shuffle Play
Press CLEAR.

You can set Shuffle Play during stop
After selecting the item of "SHUFFLE," press ▷.
The player starts Shuffle Play.

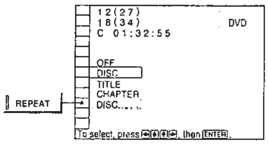
You can display the "SHUFFLE" display quickly
Press SHUFFLE on the remote.

Notes
- Shuffle Play is canceled when:
  - you eject the disc
  - you turn the power off
- You may not be able to do Shuffle Play depending on the DVD.
- Up to 200 chapters in a disc can be played in a random order when "CHAPTER" is selected.

Playing Repeatedly (Repeat Play)

DVD VIDEO CD CD

You can play all the titles/tracks on a disc or a single title/chapter/track.
In Shuffle or Program Play mode, the player repeats the titles or tracks in the shuffled or programmed order.
You cannot do Repeat Play during PBC playback of VIDEO CDs (page 23).
You may not be able to do Repeat Play depending on the DVD.
Select "REPEAT" after pressing DISPLAY. When you do not select "OFF," the indicator of the "REPEAT" lights in green.


12(27)
18(34)
C 01:32:55
DVD
OFF
DISC
TITLE
CHAPTER
REPEAT
DISC
To select, press ←/↑/↓/→, then ENTER.

■REPEAT
Selects the setting of Repeat Play.

When playing a DVD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all the titles.
- TITLE: repeats the current title on a disc.
- CHAPTER: repeats the current chapter.

When playing a VIDEO CD/CD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all the tracks on a disc.
- TRACK: repeats the current track.

When Program Play or Shuffle Play is set to ON
- OFF: does not play repeatedly.
- ON: repeats Program Play or Shuffle Play.

To cancel Repeat Play
Press CLEAR.

You can set Repeat Play during stop
After selecting the item of "REPEAT," press ▷.
The player starts Repeat Play.

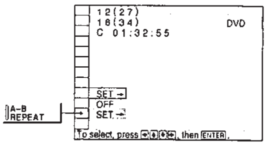
You can display the "REPEAT" display quickly
Press REPEAT on the remote.

Note
Repeat play is canceled when you turn the power off.

Repeating a Specific Portion (A↔B Repeat)

DVD VIDEO CD CD

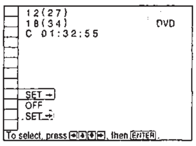
You can play a specific portion of a title, chapter, track repeatedly. This is useful when you want to memorize lyrics.
During PBC Playback of VIDEO CDs (page 23), this function is available only while playing moving pictures.
You may not be able to do A↔B Repeat Play depending on the DVD.
Select "A-B REPEAT" after pressing DISPLAY. During A↔B Repeat Play, the indicator of the "A-B REPEAT" lights in green.

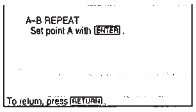

12(27)
18(34)
C 01:32:55
DVD
SET →
OFF
SET →
A-B REPEAT
To select, press ←/↑/↓/→, then ENTER.

■A-B REPEAT
- SET➡: sets the A and B points.
- OFF: does not play a specific portion of a title/chapter/track repeatedly.

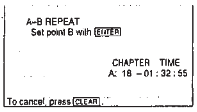
Setting a portion for A←→B repeat

1 Select "SET→" in "A-B REPEAT."
The A←→B REPEAT setting display appears.

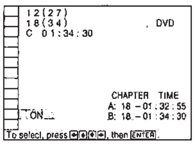

12(27)
18(34)
C 01:32:55
DVD
SET →
OFF
SET→
To select, press ←↑↓→, then ENTER.


A-B REPEAT
Set point A with ENTER.
To return, press RETURN.

2 During playback, when you find the starting point (point A) of the portion to be played repeatedly, press ENTER.
The starting point (point A) is set.


A-B REPEAT
Set point B with ENTER
CHAPTER TIME
A: 18 – 01 : 32 : 55
To cancel, press CLEAR.

3 When you reach the ending point (point B), press ENTER again.
The setting points are displayed and the player starts repeating this specific portion.
"A-B" appears on the front panel display during A←→B repeat play.


12(27)
18(34)
C 01:34:30
DVD
ON
CHAPTER TIME
A: 18 – 01 : 32 : 55
B: 18 – 01 : 34 : 30
To select, press ←↑↓→, then ENTER.

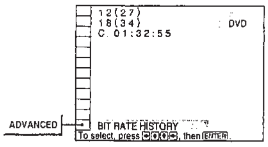
To cancel A←→B Repeat Play
Press CLEAR.

You can display the A←→B Repeat setting display quickly
Press A←→B on the remote.

Notes
- You can set A←→B Repeat on only one specific portion.
- A←→B Repeat is canceled when:
  - you eject the disc
  - you turn the power off
- When you set A←→B Repeat, the settings for Shuffle Play and Program Play are canceled.
- You may not be able to set A←→B Repeat, depending on the scene of the DVD or the VIDEO CD.

Checking the Play Information

You can check the play information on the bit rate, bit rate history or the portion where the disc is played (layer). While playing a disc, the approximate bit rate of the playback picture is always displayed by Mbps (Mega bit per second) and the audio by kbps (Kilo bit per second). Select "ADVANCED" after pressing DISPLAY.



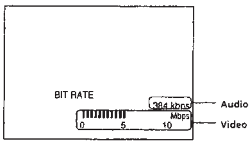
12(27)
18(34)
C 01:32:55
DVD
BIT RATE HISTORY
To select, press ←↑↓→, then ENTER.

ADVANCED

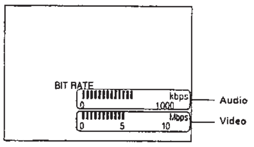
When playing a DVD
- BIT RATE: displays bit rate.
- BIT RATE HISTORY: displays bit rate and bit rate history.
- LAYER: displays layer and the point picked up.
- OFF: turns off ADVANCED display.

Displays of each item

BIT RATE

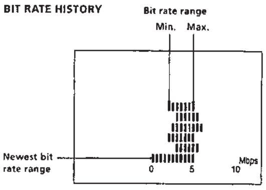


When you play MPEG AUDIO sound tracks



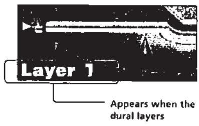
Bit rate refers to the amount of video/audio data per second in a disc. The higher the bit rate is, the larger the amount of data. When the bit rate level is high, there is a large amount of data. However, this does not always mean that you can get higher quality pictures or sounds.

BIT RATE HISTORY



Indicates the transition of bit rate of the playback picture for a period up to the present.

LAYER



Appears when the DVD has dural layers

Indicates the approximate point where the disc is playing. If it is a dual-layer DVD, the player indicates which layer is being read.
For details on the layers, see page 61 (DVD).

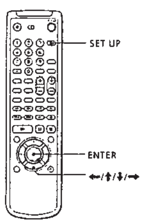
Settings and Adjustments

This chapter describes how to set and how to adjust using the on-screen SET UP menu. Most settings and adjustments are required to be set when you first use the player.
This chapter also describes how to set the remote for controlling the TV or the AV receiver (amplifier).

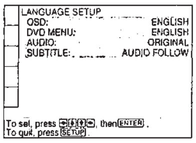
Using the Setup Display

Using the setup display, you can do the initial setup, adjusting the picture and sound quality, setting the various outputs, etc. You can also set a language for the subtitles and the setup display, limit playback by children, etc.
For details on each setup display item, see pages 45 to 53.

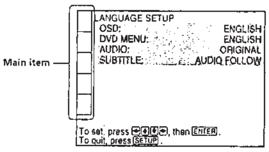
Note
You can display the setup display only when the player is in stop mode.



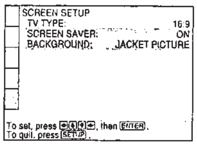
1 Press SET UP to display the setup display on the TV screen.


LANGUAGE SETUP
OSD: ENGLISH
DVD MENU: ENGLISH
AUDIO: ORIGINAL
SUBTITLE: AUDIO FOLLOW
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

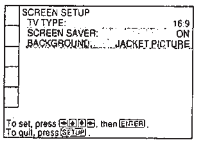
2 Select the main item you want using ↑/↓, and then press ENTER.
The selected main item is highlighted.

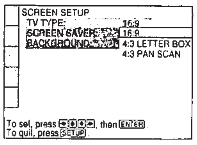


LANGUAGE SETUP
OSD: ENGLISH
DVD MENU: ENGLISH
AUDIO: ORIGINAL
SUBTITLE: AUDIO FOLLOW
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

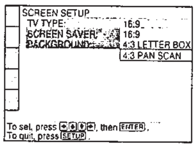

SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: ON
BACKGROUND: JACKET PICTURE
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

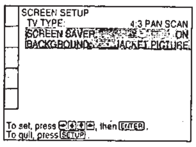
3 Select the item you want using ↑/↓, then press → or ENTER.


SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: ON
BACKGROUND: JACKET PICTURE
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.


SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: 16:9
BACKGROUND: 4:3 LETTER BOX
4:3 PAN SCAN
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

4 Select the setting you want using ←/↑/↓/→, then press ENTER.


SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: 16:9
BACKGROUND: 4:3 LETTER BOX
4:3 PAN SCAN
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.


SCREEN SETUP
TV TYPE: 4:3 PAN SCAN
SCREEN SAVER: ON
BACKGROUND: JACKET PICTURE
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

To cancel using the setup display on the way
Press SET UP on the remote.

Note
Some setup display items require operations other than selecting the setting. For details on these items, see the relevant pages.

Setup Display Item List

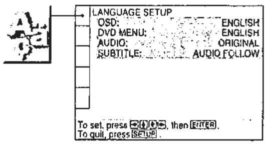
Default settings are underlined.

- LANGUAGE SETUP (page 45)
  - OSD
    - ENGLISH
    - FRANÇAIS
    - DEUTSCH
    - ITALIANO
    - ESPAÑOL
    - NEDERLANDS
    - DANSK
    - SVENSKA
    - SUOMI
    - NORSK
    - PORTUGUÊS
  - DVD MENU
    - ENGLISH
    - FRANÇAIS
    - DEUTSCH
    - ITALIANO
    - ESPAÑOL
    - NEDERLANDS
    - DANSK
    - SVENSKA
    - SUOMI
    - NORSK
    - PORTUGUÊS
    - PУССКИЙ
    - CHINESE
    - JAPANESE
    - OTHERS ➡
  - AUDIO
    - ORIGINAL
    - (same as DVD MENU)
  - SUBTITLE
    - AUDIO FOLLOW
    - (same as DVD MENU)
- SCREEN SETUP (page 46)
  - TV TYPE
    - 16:9
    - 4:3 LETTER BOX
    - 4:3 PAN SCAN
  - SCREEN SAVER
    - ON
    - OFF
  - BACKGROUND
    - JACKET PICTURE
    - GRAPHICS
    - BLUE
    - BLACK
- CUSTOM SETUP (page 47)
  - AUTO PLAY
    - OFF
    - TIMER
    - DEMO1
    - DEMO2
  - DIMMER
    - BRIGHT
    - DARK
    - OFF
    - AUTO
  - PAUSE MODE
    - AUTO
    - FRAME
  - PARENTAL CONTROL ➡
- AUDIO SETUP (page 50)
  - AUDIO ATT
    - OFF
    - ON
  - AUDIO DRC
    - STANDARD
    - TV MODE
    - WIDE RANGE
  - TRACK SELECTION
    - OFF
    - AUTO
  - DOWNMIX
    - DOLBY SURROUND
    - NORMAL
  - DIGITAL OUT
    - ON
      - DOLBY DIGITAL
      - MPEG
      - DTS
    - OFF
- SPEAKER SETUP (page 53)
  - SUBWOOFER
    - NONE
    - YES
      - FRONT SPEAKER SIZE
        - LARGE
        - MIDDLE
        - SMALL
        - TV

Setting the Language for Display and Sound (LANGUAGE SETUP) DVD VIDEO CD CD

Select "LANGUAGE SETUP" after pressing SET UP.
"LANGUAGE SETUP" allows you to set various languages for on-screen display or sound.
Default settings are underlined.

Note
When you select a language that is not recorded on the DVD, one of the recorded languages is automatically selected except for the "OSD."



LANGUAGE SETUP
OSD: ENGLISH
DVD MENU: ENGLISH
AUDIO: ORIGINAL
SUBTITLE: AUDIO FOLLOW
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■OSD (On-Screen Display)

Switches the language for the on-screen display.

- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)

■DVD MENU

Switches the language for the DVD menu.

- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- PУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡
  When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63).
  After you have once selected, the language code (4 digits) is displayed.

■AUDIO

Switches the language for the sounds.

- ORIGINAL: the language given priority in the disc
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- PУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡
  When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63).
  After you have once selected, the language code (4 digits) is displayed.

■SUBTITLE

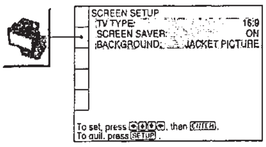
Switches the language for the subtitles.

- AUDIO FOLLOW*
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- PУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡
  When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63).
  After you have once selected, the language code (4 digits) is displayed.

* When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language for the setting you selected in "AUDIO."

Settings for Display (SCREEN SETUP) DVD VIDEO CD CD

Select "SCREEN SETUP" after pressing SET UP.
"SCREEN SETUP" allows you to set the display according to the playback conditions.
Default settings are underlined.



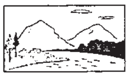
SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: ON
BACKGROUND: JACKET PICTURE
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■TV TYPE

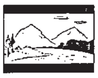
Selects the aspect ratio of the TV to be connected.

- 16:9: when you connect a wide-screen TV to the player.
- 4:3 LETTER BOX: when you connect a normal TV to the player. Displays a wide picture with bands displayed on the upper and lower portions of the screen.
- 4:3 PAN SCAN: when you connect a normal TV to the player. Displays the wide picture on the whole screen with a portion automatically cut off.

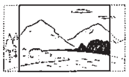
16:9



4:3 LETTER BOX



4:3 PAN SCAN



Note
Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" and vice versa.

■SCREEN SAVER

Turns on and off the screen saver. If you turn on the screen saver, the screen saver image appears when you leave the player or the remote in pause or stop mode for 15 minutes or when you play back a CD for more than 15 minutes. The screen saver is useful to prevent your display from becoming damaged.

- ON: turns on the screen saver.
- OFF: turns off the screen saver.

■BACKGROUND

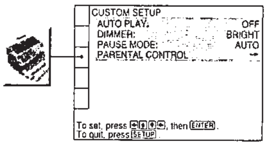
Selects the background color or picture of the TV screen in stop mode or while playing a CD.

- JACKET PICTURE: The jacket picture appears in the background, but only when the jacket picture is already recorded on the disc.
- GRAPHICS: The graphic picture stored in memory in the player beforehand appears in the background.
- BLUE: The background color is blue.
- BLACK: The background color is black.

Note
If a disc which does not contain the jacket picture is played while "BACKGROUND" is set to "JACKET PICTURE," the graphic picture stored in the player will automatically appear in the background.

Custom Settings (CUSTOM SETUP) DVD VIDEO CD CD

Select "CUSTOM SETUP" after pressing SET UP.
"CUSTOM SETUP" allows you to set the playback conditions.
Default settings are underlined.



CUSTOM SETUP
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL ➡
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■AUTO PLAY

Selects the setting of Auto Play when you connect the AC power cord to the AC outlet.

- OFF: does not use "TIMER," "DEMO1" or "DEMO2" to start playing.
- TIMER: starts playing a disc automatically when you connect the AC power cord to the AC outlet. By connecting a timer (not supplied), you can start playing at any time you want.
- DEMO1: starts playing the demonstration 1 automatically.
- DEMO2: starts playing the demonstration 2 automatically.

■DIMMER

Adjusts the lighting of the front panel display.

- BRIGHT: makes the front panel display bright.
- DARK: makes the front panel display dark.
- OFF: turns off the lighting of the front panel display.
- AUTO: turns on the front panel display for a few seconds when a button on the player or the remote is pressed.

■PAUSE MODE (DVD only)

Selects the picture in pause mode.

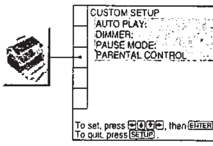
- AUTO: A picture including subjects that move dynamically is output with no jitter. Normally select this position.
- FRAME: A picture including subjects that do not move dynamically is output with high resolution.

■PARENTAL CONTROL ➡

Sets a password and playback limitation level when you play DVDs with playback limitation for children.
For details, see "Limiting Playback by Children (Parental Control) ."

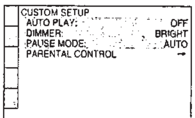
Limiting Playback by Children (Parental Control) DVD

Select "CUSTOM SETUP" after pressing SET UP.
Playing some DVDs can be limited depending on the age of users. The "Parental Control" function allows you to set a playback limitation level.



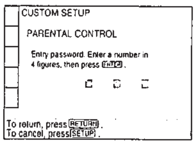
CUSTOM SETUP
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL ➡
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

1 Select "PARENTAL CONTROL" using ↑/↓, then press ENTER.



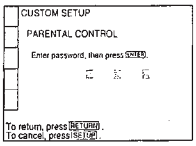
CUSTOM SETUP
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL ➡
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■When you have not entered a password yet
The display for entering a password appears.

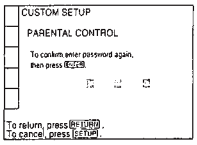


CUSTOM SETUP
PARENTAL CONTROL
Entry password. Enter a number in 4 figures, then press ENTER.
To return, press RETURN.
To cancel, press SETUP.

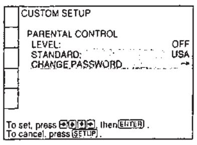
■When you have already entered a password
The display for confirming the password appears. Skip Step 2.


CUSTOM SETUP
PARENTAL CONTROL
Enter password, then press ENTER.
To return, press RETURN.
To cancel, press SETUP.

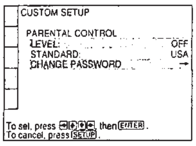
2 **Enter a password in 4 digits using the number buttons, then press ENTER.**
The digits change to asterisks (✻), and the display for confirming the password appears.


CUSTOM SETUP
PARENTAL CONTROL
To confirm, enter password again, then press ENTER.
To return, press RETURN.
To cancel, press SETUP.

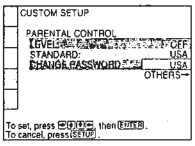
3 **To confirm your password, enter it using the number buttons, then press ENTER.**
The display for setting the playback limitation level and changing the password appears.


CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD →
To set, press ←↑↓→, then ENTER.
To cancel, press SETUP.

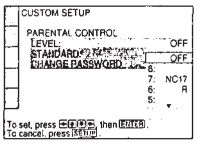
4 **Select "STANDARD" using ↑/↓, then press →.**


CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD →
To set, press ←↑↓→, then ENTER.
To cancel, press SETUP.

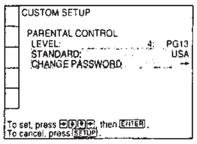
5 **Select an area as the standard for playback limitation level using ↑/↓, then press →.**
When you select "OTHERS→," select and enter the standard code in the table below using number buttons.


CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD USA
OTHERS→
To set, press ←↑↓→, then ENTER.
To cancel, press SETUP.

6 **Select "LEVEL" using ↑/↓, then press →.**


CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: OFF
CHANGE PASSWORD 8:
7: NC17
6: R
5:
To set, press ←↑↓→, then ENTER.
To cancel, press SETUP.

7 **Select the level you want using ↑/↓, then press ENTER.**


CUSTOM SETUP
PARENTAL CONTROL
LEVEL: 4: PG13
STANDARD: USA
CHANGE PASSWORD →
To set, press ←↑↓→, then ENTER.
To cancel, press SETUP.

The lower the value is, the more strict the limitation.

To return to the normal screen
Press SET UP.

To turn off the Parental Control function and play the DVD after entering your password
Set "LEVEL" to "OFF" in Step 7, then press ▷.

To change the password
1 After Step 3, select "CHANGE PASSWORD" using ↑/↓, then press → or ENTER.
The display for changing the password appears.
2 Follow Steps 2 and 3 to enter a new password.

💡 You can turn off the Parental Control function just after inserting the DVD (Parental Control Temporarily Canceled)
When you set a playback limitation level and insert the DVD, the PARENTAL CONTROL display appears. Enter the password to turn off the Parental Control function.
When you stop playing the DVD, the level returns to the original level.

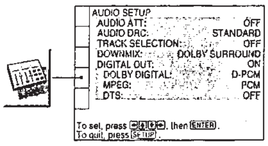
💡 If you have forgot your password
Enter the 6 digits number "199703" in Step 2 to clear the current password. To enter a new password, follow the procedure from Step 2 again.

Notes
- When you play DVDs which do not have the Parental Control function, playback cannot be limited on this player.
- When you do not set a password, you cannot change the settings for playback limitation.
- Depending on the DVD, you may be asked to change the parental control level while playing the disc. In this case, enter the password, then change the level.
  When you stop playing the DVD, the level returns to the original level.

Standard	Code number
Austria	2046
Belgium	2057
Canada	2079
China	2092
Denmark	2115
Finland	2165
France	2174
Germany	2109
Hong Kong	2219
Indonesia	2238
Italy	2254
Japan	2276
Malaysia	2363
Netherlands	2376
Norway	2379
Philippines	2424
Russian	2489
Singapore	2501
Spain	2149
Sweden	2499
Switzerland	2086
Taiwan	2543
Thailand	2528
United Kingdom	2184

Settings for Sound (AUDIO SETUP)

Select "AUDIO SETUP" after pressing SET UP.
"AUDIO SETUP" allows you to set the sound according to the playback conditions.
Default settings are underlined.


AUDIO SETUP
AUDIO ATT: OFF
AUDIO DRC: STANDARD
TRACK SELECTION: OFF
DOWNMIX: DOLBY SURROUND
DIGITAL OUT: ON
DOLBY DIGITAL: D-PCM
MPEG: PCM
DTS: OFF
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■AUDIO ATT (attenuation)
Selects the setting of the output from the LINE OUT (AUDIO) connectors according to the audio equipment to be connected.
- OFF: turns off the audio attenuation.
- ON: reduces the audio output level so that no sound distortion occurs.

Note
The setting does not affect the output from the OPTICAL and COAXIAL connectors.

■AUDIO DRC (Dynamic Range Control)
Makes the sound clear with the volume turned down at night, etc., when you play a DVD. This affects the output from the OPTICAL and COAXIAL connectors only when "PCM" in "DIGITAL OUT" is set to "ON," and it affects the output from the LINE OUT (AUDIO) connectors.
- STANDARD: Normally select this position.
- TV MODE: makes the low sound clear even if you turned the volume down, so it is good for playing at night. It is especially recommended when you listen to the sound using the speakers of the TV.
- WIDE RANGE: It gives you the feeling of being at a live performance. When you use high quality speakers, it is more effective.

Notes
- When you play DVDs without the AUDIO DRC function, there may be no effects on the sound.
- When this item is set to "WIDE RANGE," the sound volume may be less than usual.

■TRACK SELECTION
Gives the sound track which contains the highest number of the channels priority when you play a DVD on which multiple audio formats are recorded. If multiple audio channels are recorded in PCM, DTS, MPEG AUDIO or Dolby Digital format, the higher-numbered channel audio recorded in PCM, DTS, MPEG AUDIO or Dolby Digital format is played.
- OFF : No priority given.
- AUTO : Priority given.

Notes
- When you set this item to "AUTO," the language may change depending on the "AUDIO" settings in "LANGUAGE SETUP." The "TRACK SELECTION" setting has higher priority than that of "AUDIO" settings in "LANGUAGE SETUP" (page 45).
- If you set "DTS" in "AUDIO SETUP" to "OFF," the DTS sound track is not played even if you set this item to "AUTO" and the highest-numbered channel audio is recorded in DTS format.
- If PCM, DTS, MPEG AUDIO and Dolby Digital sound tracks have the same number of the highest channels, the player selects PCM, DTS, Dolby Digital and MPEG AUDIO sound tracks, in this order.
- Depending on the DVD, the audio with priority may be predetermined. In this case, you cannot give priority to the DTS, MPEG AUDIO or Dolby Digital format by selecting "AUTO."

■DOWNMIX*
Switches the mixing down methods when you play a DVD on which 3 or more channels in Dolby Digital format are recorded.
- DOLBY SURROUND: when the player is connected to an audio component that conforms to Dolby Surround (Pro Logic).
- NORMAL: when the player is connected to a normal audio component.

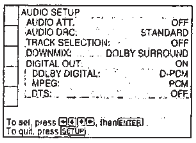
* The setting affects the following connectors:
–LINE OUT (AUDIO) connectors
–OPTICAL and COAXIAL connectors

■DIGITAL OUT
Selects output signals via the OPTICAL and COAXIAL connectors.
- ON: Normally select this position. When you select "ON," set "DOLBY DIGITAL," "MPEG" and "DTS." For details on setting them, see "Setting for the signal to the digital output."
- OFF: when the player does not output the sound signals via the OPTICAL and COAXIAL connectors, if you select this position, the influence of the digital circuit upon the analog one is minimum.

Notes
- When you play the sound tracks with 96 kHz sampling frequency, the output signals from the OPTICAL and COAXIAL connectors are converted to 48 kHz (sampling frequency). When the signals are output from LINE OUT (AUDIO) connectors, sampling frequency stays at 96 kHz and the output signals are converted to analog signals.
- When you select "OFF," you cannot set "DOLBY DIGITAL," "MPEG" and "DTS."

Setting for the signal to the digital output

When you select "ON," set "DOLBY DIGITAL," "MPEG" and "DTS."
Switches the methods of outputting audio signals when you connect a digital component such as a receiver (amplifier) having a digital connector, an audio component having a built-in DTS decoder, a DAT or MD via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord. For details on the connection, see pages 13 and 15.


AUDIO SETUP
AUDIO ATT: OFF
AUDIO DRC: STANDARD
TRACK SELECTION: OFF
DOWNMIX: DOLBY SURROUND
DIGITAL OUT: ON
DOLBY DIGITAL: D-PCM
MPEG: PCM
DTS: OFF
To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■DOLBY DIGITAL
Selects output Dolby Digital signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."
- D-PCM (Downmix PCM): when you play the Dolby Digital sound tracks, the output audio signals are mixed down to 2 channels. With the settings of the item "DOWN MIX" in "AUDIO SETUP," you can select whether the signals conform to Dolby Surround (Pro Logic) or not.
- DOLBY DIGITAL: when the player is connected to an audio component with a built-in Dolby Digital decoder.

Note
If the player is connected to an audio component lacking a built-in Dolby Digital decoder, do not set "DOLBY DIGITAL" in "AUDIO SETUP" to "DOLBY DIGITAL." Otherwise, when you play the Dolby Digital sound track, a loud noise or no sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

■MPEG
Selects output MPEG AUDIO signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."
- PCM: when the player is connected to an audio component lacking a built-in MPEG decoder. If you play MPEG AUDIO sound tracks, the player outputs stereo signals taken from MPEG AUDIO signals via the OPTICAL and COAXIAL connectors.
- MPEG: when the player is connected to an audio component having a built-in MPEG decoder.

Note
If the player is connected to an audio component lacking a built-in MPEG decoder, do not set "MPEG" in "AUDIO SETUP" to "MPEG." Otherwise, when you play the MPEG AUDIO sound track, a loud noise will come out from the speakers, affecting your ears or causing the speakers to be damaged.

Note
The player outputs the MPEG analog audio sound only from the front speakers when you set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "MPEG" to "MPEG."

■DTS

Selects output DTS signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."

- OFF: when the player is connected to an audio component lacking a built-in DTS decoder.
- ON: when the player is connected to an audio component having a built-in DTS decoder.

Note

Select the setting correctly. Otherwise, no sound or strange sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

- **Do not play the DTS sound tracks without connecting the player to an audio component having a built-in DTS decoder. You cannot hear the DTS sound unless you connect the player to an audio component having a built-in DTS decoder.**
- **When you play the DTS sound track on a CD, a loud noise may come out from the LINE OUT (AUDIO) and PHONES connectors, affecting your ears or causing the speakers or headphones to be damaged.**
- **When you play the DTS sound track on a DVD, no sounds will come out from the LINE OUT (AUDIO) and PHONES connectors.**

Notes on playing the DTS sound tracks on a CD

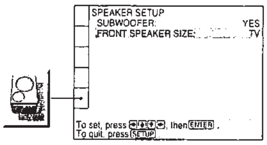
- Do not play the DTS sound tracks without connecting the player to an audio component having a built-in DTS decoder. The player outputs the DTS signal via the OPTICAL and COAXIAL connectors even if "DTS" in "AUDIO SETUP" is set to "OFF" in the setup display, affecting your ears or causing the speakers to be damaged.
- The DTS indicator on the front panel does not light up even if the player outputs DTS signal via the OPTICAL and COAXIAL connectors.
- Set the sounds to "STEREO" when you play the DTS sound tracks on a CD. (See "Changing the Sounds" on page 32.) If you set the sounds to "1/L" or "2/R," no sounds will come out from the OPTICAL and COAXIAL connectors.

Notes on playing the DTS sound tracks on a DVD

- No sounds will come out from the LINE OUT (AUDIO) and PHONES connectors.
- If the player is connected to an audio component lacking a built-in DTS decoder, do not set "DTS" in "DIGITAL OUT" to "ON" in the setup display. Otherwise, when you play the DTS sound track, a loud noise will come out from the speakers, affecting your ears or causing the speakers to be damaged.
- When you set "DTS" in "AUDIO SETUP" to "OFF," no sound will come out from the OPTICAL and COAXIAL connectors even if you play DTS sound tracks on DVDs.
- The DTS indicator on the front panel display lights up when you play DTS sound tracks.

Speaker Set Up

Select "SPEAKER SETUP" after pressing SET UP.
When you have connected a subwoofer, specify the size of the front speakers you have connected to change the frequency range output from the subwoofer so that you can obtain the best possible surround sound.
Even if you change the setting of "SUBWOOFER" or "FRONT SPEAKER SIZE," the sound output from the front speakers do not change.
For the speaker hookups, see pages 12 and 14.



SPEAKER SETUP
SUBWOOFER: YES
FRONT SPEAKER SIZE: TV

To set, press ←↑↓→, then ENTER.
To quit, press SETUP.

■SUBWOOFER

Selects whether a subwoofer is connected to the player or not.

- NONE: When a subwoofer is not connected to the player.
- YES: When a subwoofer is connected to the player, you can select the output level from the subwoofer in "FRONT SPEAKER SIZE" according to the front speakers you are using.

■FRONT SPEAKER SIZE:

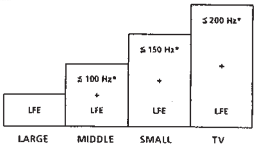
Selects the size of the connected front speakers. The frequency range output from the subwoofer varies according to the size of the front speakers.
You cannot select this item when you set "SUBWOOFER" to "NONE."

- LARGE: If you connect large speakers that will effectively reproduce bass frequencies, and play a DVD recorded in 5 channel including LFE signal, select this. If you feel a lack of bass frequencies from the front speakers when you select this, select "MIDDLE."
- MIDDLE: If you connect large speakers that will effectively reproduce bass frequencies and play a source on which LFE signal is not recorded, select this to output the bass frequencies in the front channel also from the subwoofer.
  If you feel a lack of bass frequencies from the front speakers when you select this, select "SMALL."
- SMALL: If the sound is distorted, or you feel a lack of surround effects, select this to output the bass frequencies, which the front speakers cannot output, from the subwoofer.
  If you feel a lack of bass frequencies from the front speakers when you select this, select "TV."
- TV: If you do not connect front speakers, select this to output the bass frequencies from the subwoofer.
  If you connect small speakers, select this.

Note

If LFE signal is not recorded in the disc, no sound will be output from the subwoofer even if you select "LARGE."

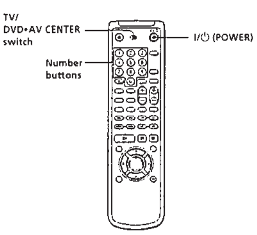
The subwoofer outputs LFE signal and the frequency range shown below depending on the FRONT SPEAKER SIZE setting.
The LFE signal is output only when the disc contains the LFE signal.



* Audio signal besides LFE

Controlling the TV or the AV Receiver (Amplifier) with the Supplied Remote

If you adjust the remote signal, you can control your TV with the supplied remote. Default setting is to control Sony TVs with the mark.
When you connect the player to a Sony AV receiver (amplifier), you can also set the input of the receiver (amplifier) to this player with the supplied remote .



Controlling TVs with the remote

1 Slide the TV/DVD•AV CENTER switch to TV.

2 Hold down I/⏻ (POWER), and enter your TV's manufacturer's code (see the table) using the number buttons. Then release I/⏻ (POWER).

Code numbers of controllable TVs

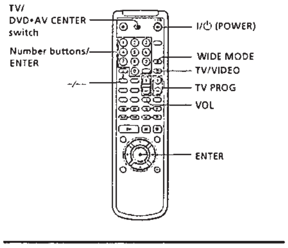
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony (default)	01
Grundig	11
Hitachi	24
Loewe	45
Nokia	15, 16, 69
Panasonic	17, 49
Philips	06, 07, 08
Saba	12, 13
Samsung	22, 23
Sanyo	25
Sharp	29
Telefunken	36
Thomson	43
Toshiba	38

Notes

- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may reset to 01 (Sony). Reset the appropriate code number.

When you set the TV/DVD•AV CENTER switch to TV, you can control your TV using the keys below.



By pressing	You can
I/⏻ (POWER)	Turn the TV on or off
TV/VIDEO	Select the input source for the TV between the TV and VCR
VOL	Adjust the volume of the TV
TV PROG	Select the program position of the TV
WIDE MODE	Switch the wide picture on or off
Number buttons and ENTER	Select the program position of the TV

Notes

- Depending on the TV, you may not be able to control your TV or to use some of the buttons above.
- If you use number buttons to select program position of the TV, press -/-- followed by the number buttons for two-digit numbers.

Controlling an AV receiver (amplifier) with the remote

1 Slide the TV/DVD•AV CENTER switch to DVD•AV CENTER.

2 Hold down I/⏻ (POWER), and enter your AV receiver's manufacturer's code (see the table below) using the number buttons. Then release I/⏻ (POWER).

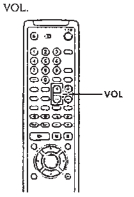
Manufacturer	Code number
Sony	91(default), 88, 89
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sansui	87
Technics	97, 98
Yamaha	94, 95, 96
–	90*

* By setting the code number 90, you can adjust the volume of the TV even if the TV/DVD•AV CENTER switch is on the DVD•AV CENTER side, if you do not control an AV receiver (amplifier) with the remote.

Code numbers of controllable receivers (amplifiers)

If more than one code number is listed, try entering them one at a time until you find the one that works with your receiver (amplifer).

You can also change the sound volume of the AV receiver (amplifier) using VOL.



Note

Depending on the AV receiver (amplifier), you may not be able to control your AV receiver (amplifier).

Self-diagnosis Function

When the self-diagnosis function works to prevent the player from malfunctioning, a five-character service number (combination of a letter and digits) flashes on the front panel display. In this case, check the following table.

First three characters	Cause and/or Corrective Action
C13	• The disc is dirty. ➡Clean the disc with a cleaning cloth (page 7).
C31	• The disc is not inserted correctly. ➡Insert the disc correctly.
Exx (xx is any number)	• To prevent the player from malfunctioning, the self-diagnosis function has worked. ➡When you contact your Sony dealer or local authorized Sony service facility, give the 5-character service number. (example: E:61:10)

Language Code List

For details, see pages 33 and 45.

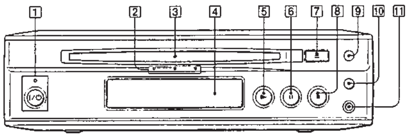
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1186	Scots Gaelic	1350	Malayalam	1513	Siswati
1028	Abkhazian	1194	Galician	1352	Mongolian	1514	Sesotho
1032	Afrikaans	1196	Guarani	1353	Moldavian	1515	Sundanese
1039	Amharic	1203	Gujarati	1356	Marathi	1516	Swedish
1044	Arabic	1209	Hausa	1357	Malay	1517	Swahili
1045	Assamese	1217	Hindi	1358	Maltese	1521	Tamil
1051	Aymara	1226	Croatian	1363	Burmese	1525	Telugu
1052	Azerbaijani	1229	Hungarian	1365	Nauru	1527	Tajik
1053	Bashkir	1233	Armenian	1369	Nepali	1528	Thai
1057	Byelorussian	1235	Interlingua	1376	Dutch	1529	Tigrinya
1059	Bulgarian	1239	Interlingue	1379	Norwegian	1531	Turkmen
1060	Bihari	1245	Inupiak	1393	Occitan	1532	Tagalog
1061	Bislama	1248	Indonesian	1403	(Afan) Oromo	1534	Setswana
1066	Bengali; Bangla	1253	Icelandic	1408	Oriya	1535	Tonga
1067	Tibetan	1254	Italian	1417	Punjabi	1538	Turkish
1070	Breton	1257	Hebrew	1428	Polish	1539	Tsonga
1079	Catalan	1261	Japanese	1435	Pashto; Pushto	1540	Tatar
1093	Corsican	1269	Yiddish	1436	Portuguese	1543	Twi
1097	Czech	1283	Javanese	1463	Quechua	1557	Ukrainian
1103	Welsh	1287	Georgian	1481	Rhaeto-Romance	1564	Urdu
1105	Danish	1297	Kazakh	1482	Kirundi	1572	Uzbek
1109	German	1298	Greenlandic	1483	Romanian	1581	Vietnamese
1130	Bhutani	1299	Cambodian	1489	Russian	1587	Volapük
1142	Greek	1300	Kannada	1491	Kinyarwanda	1613	Wolof
1144	English	1301	Korean	1495	Sanskrit	1632	Xhosa
1145	Esperanto	1305	Kashmiri	1498	Sindhi	1665	Yoruba
1149	Spanish	1307	Kurdish	1501	Sangho	1684	Chinese
1150	Estonian	1311	Kirghiz	1502	Serbo-Croatian	1697	Zulu
1151	Basque	1313	Latin	1503	Singhalese	1703	Not specified
1157	Persian	1326	Lingala	1505	Slovak		
1165	Finnish	1327	Laothian	1506	Slovenian		
1166	Fiji	1332	Lithuanian	1507	Samoan		
1171	Faroese	1334	Latvian; Lettish	1508	Shona		
1174	French	1345	Malagasy	1509	Somali		
1181	Frisian	1347	Maori	1511	Albanian		
1183	Irish	1349	Macedonian	1512	Serbian		

Index to Parts and Controls

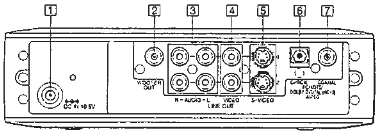
Refer to the pages indicated in parentheses for details.

Front Panel



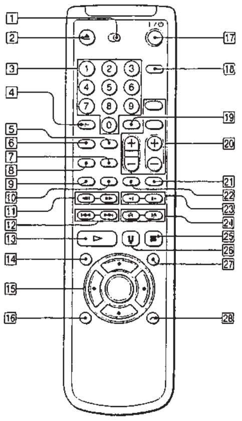
1 **I/⏻ (POWER) button and indicator (18)**
Turns on and off the power of the player.
2 **Disc type indicator (18)**
Lights up when the corresponding disc was inserted.
3 **Disc slot (18)**
Insert a disc.
4 **Front Panel Display (24)**
Indicates the playing time, etc.
5 **▷PLAY button and indicator (18)**
Plays a disc.
6 **❚❚PAUSE button and indicator (19)**
Pauses playing a disc.
7 **≜EJECT button (19)**
Ejects the disc.
8 **■STOP button (19, 21)**
Stops playing a disc.
9 **⊡ (remote sensor) (8)**
Accepts the remote control signals.
10 **PHONES LEVEL control (18)**
Press and adjust the headphone volume. After adjusting, press it again.
11 **PHONES connector (18)**
Connect the headphones to this connector.

Rear Panel



1 **DC IN 10.5 V jack (10, 12, 14, 16)**
Connects the supplied AC power adaptor.
2 **WOOFER OUT connector (14)**
Connects to a subwoofer (not supplied).
3 **LINE OUT (AUDIO) connectors (10, 12, 14)**
Connect to the audio input connector on the TV or receiver (amplifier).
4 **LINE OUT (VIDEO) connector (10)**
Connects to the video input connector on the TV or monitor.
5 **LINE OUT (S-VIDEO) connector (10, 12, 14)**
Connects to the S video input connector on the TV or monitor.
6 **OPTICAL connector (13, 16)**
Connects to an audio component using the optical digital connecting cord.
7 **COAXIAL connector (13, 16)**
Connects to an audio component using the coaxial digital connecting cord.

Remote



1 **TV/DVD•AV CENTER switch (54)**
Selects to control the player, the TV or the receiver (amplifier) with the remote.

2 **≜ (eject) button (19)**
Ejects the disc.

3 **Number buttons**
Select the items or settings.

4 **CLEAR/ -/-- (ten's digit) button (37, 38, 39, 40)**
Press to return to the Continuous play, etc.

5 **REPEAT button (39)**
Displays the "REPEAT" display on the TV screen.

6 **SHUFFLE button (38)**
Displays the "SHUFFLE" display on the TV screen.

7 **A←→B button (40)**
Displays the "A←→B REPEAT" display on the TV screen.

8 **PROGRAM button (37)**
Displays the "PROGRAM" display on the TV screen.

9 **AUDIO button (32)**
Changes the sound while playing a DVD or VIDEO CD.

10 **ANGLE button (34)**
Changes the angles when playing a DVD.

11 **◀II/II▶ STEP buttons (20)**
Play a disc frame by frame.

12 **I◀◀/▶▶I PREV/NEXT buttons (19)**
Press to go to the next chapter or track or to go back to the previous chapter or track.

13 **▷PLAY button (19)**
Plays a disc.

14 **TITLE button (22)**
Displays the title menu on the TV screen.

15 **←/↑/↓/→/ENTER button**
Selects and executes the items or settings.

16 **DISPLAY button (26)**
Displays the Control Menu display on the TV screen to set or adjust the items.

17 **I/⏻ (POWER) button (19)**
Turns on and off the power of the player and TV.

18 **SET UP button (42)**
Displays the setup display on the TV screen to set or adjust the items.

19 **ENTER button**
Executes the items or settings.

20 **TV/receiver (amplifier) operation buttons (55)**
Controls TVs and receivers (amplifiers).

21 **TIME/TEXT button (24)**
Displays the playing time of the disc, etc., on the front panel display.

22 **SUBTITLE button (33)**
Displays the "SUBTITLE" menu in the Control Menu display.

23 **◀I/I▶ SLOW buttons (20)**
Play a disc in slow motion.

24 **⊖/⊕ SCAN buttons (19, 20)**
Locate a point while monitoring the picture.

25 **■STOP button (19, 21)**
Stops playing a disc.

26 **IIPAUSE button (19)**
Pauses playing a disc.

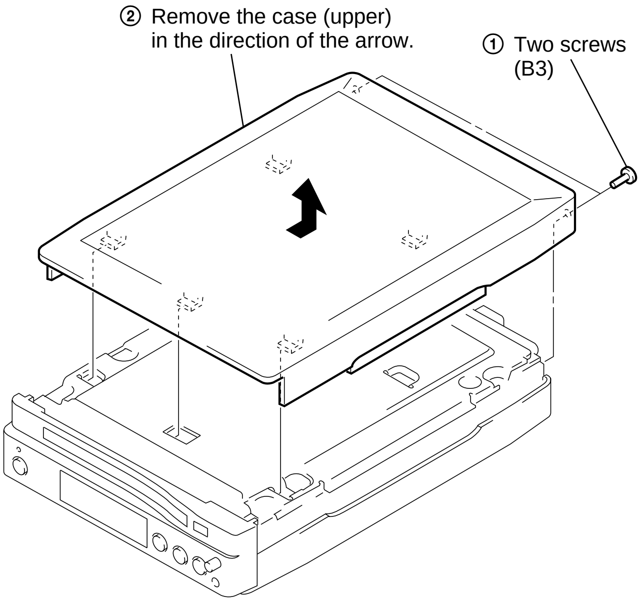
27 **DVD MENU button (22)**
Displays the DVD menu on the TV screen.

28 **↶RETURN button (23, 27)**
Press to return to the previously selected screen, etc.

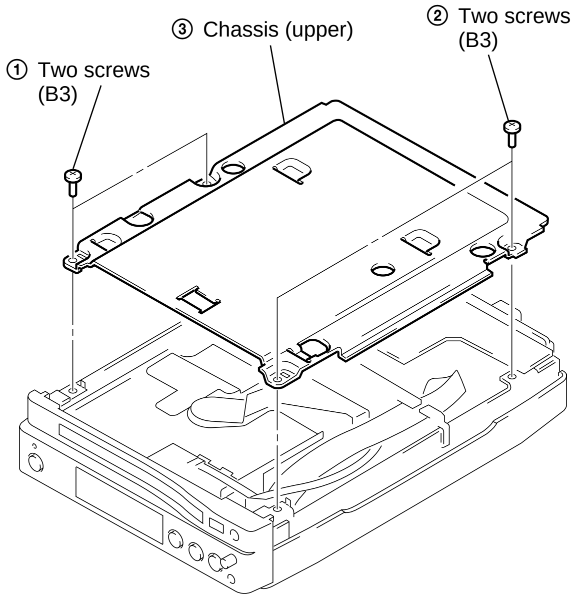
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

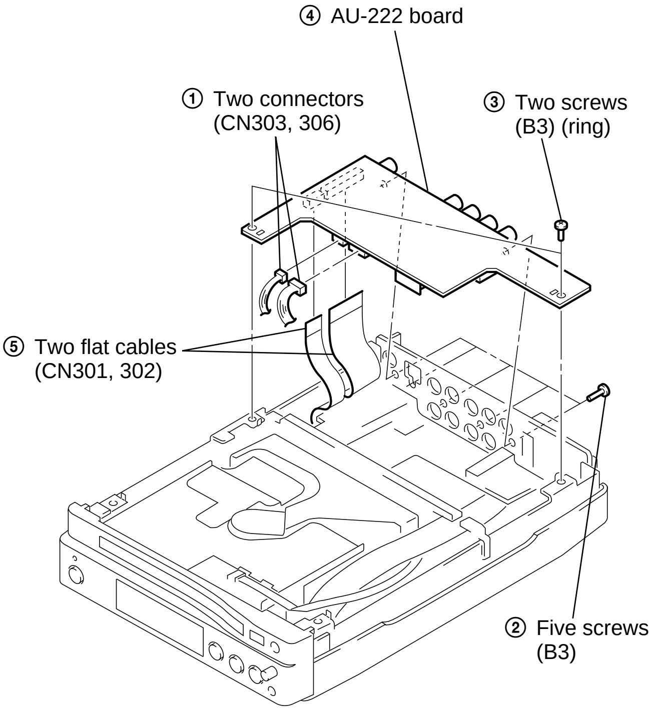
2-1. CASE (UPPER) REMOVAL


② Remove the case (upper)
in the direction of the arrow.
① Two screws
(B3)

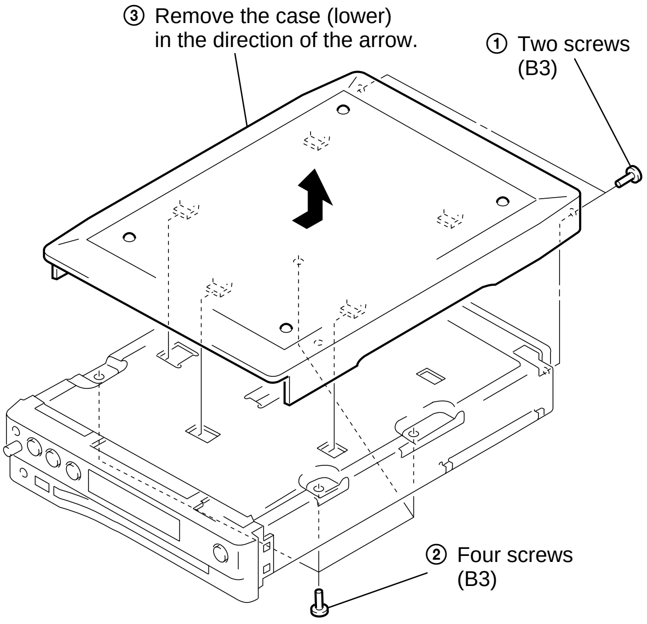
2-2. CHASSIS (UPPER) REMOVAL


③ Chassis (upper)
② Two screws
(B3)
① Two screws
(B3)

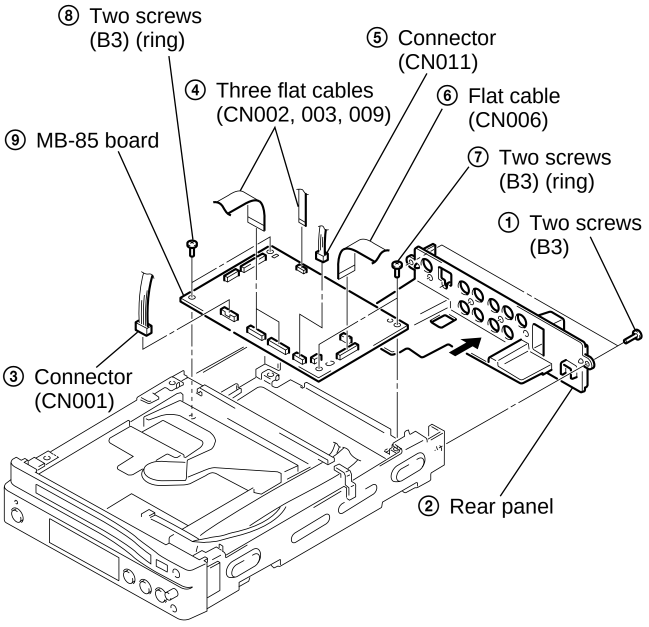
2-3. AU-222 BOARD REMOVAL


④ AU-222 board
① Two connectors
(CN303, 306)
③ Two screws
(B3) (ring)
⑤ Two flat cables
(CN301, 302)
② Five screws
(B3)

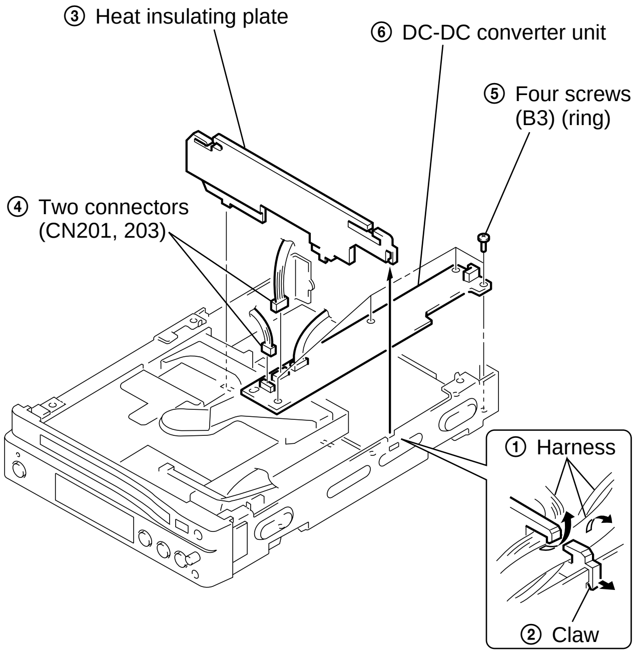
2-4. CASE (LOWER) REMOVAL


③ Remove the case (lower)
in the direction of the arrow.
① Two screws
(B3)
② Four screws
(B3)

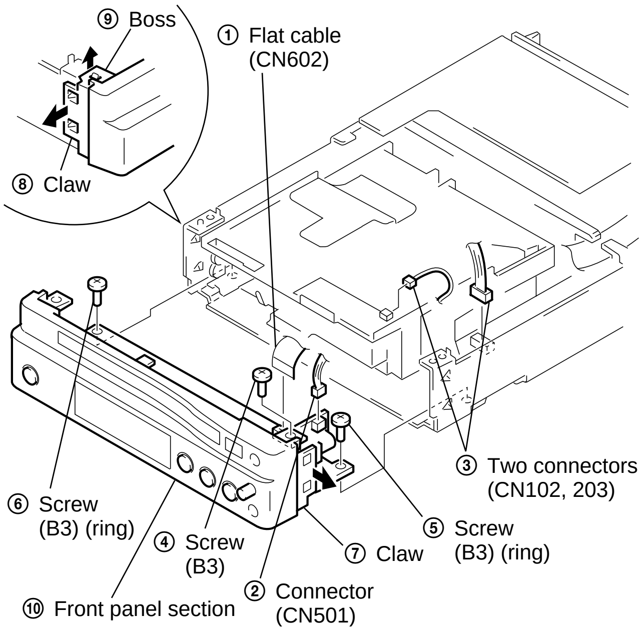
2-5. REAR PANEL, MB-85 BOARD REMOVAL


⑧ Two screws (B3) (ring)
⑤ Connector (CN011)
④ Three flat cables (CN002, 003, 009)
⑥ Flat cable (CN006)
⑨ MB-85 board
⑦ Two screws (B3) (ring)
① Two screws (B3)
③ Connector (CN001)
② Rear panel

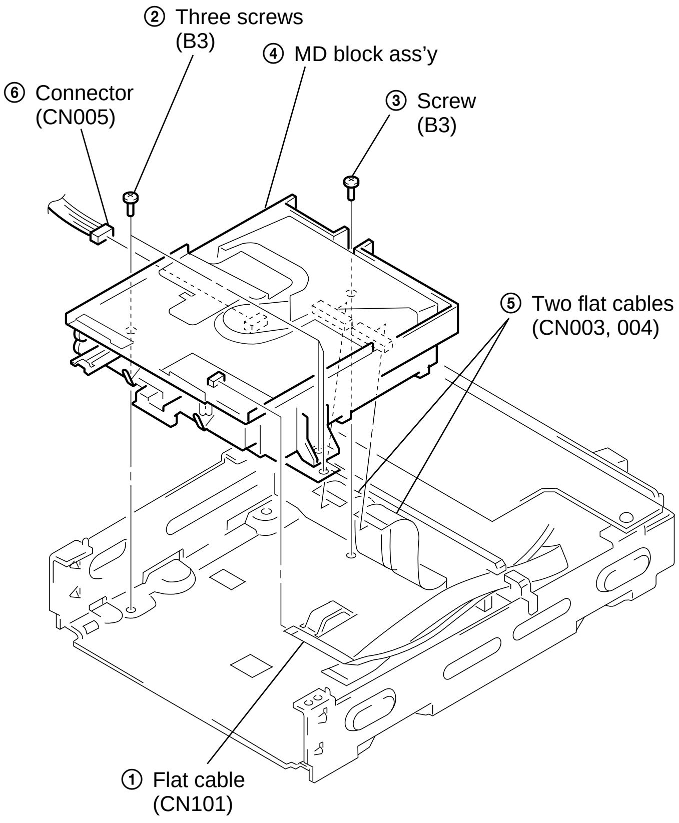
2-6. DC-DC CONVERTER UNIT REMOVAL


③ Heat insulating plate
⑥ DC-DC converter unit
⑤ Four screws (B3) (ring)
④ Two connectors (CN201, 203)
① Harness
② Claw

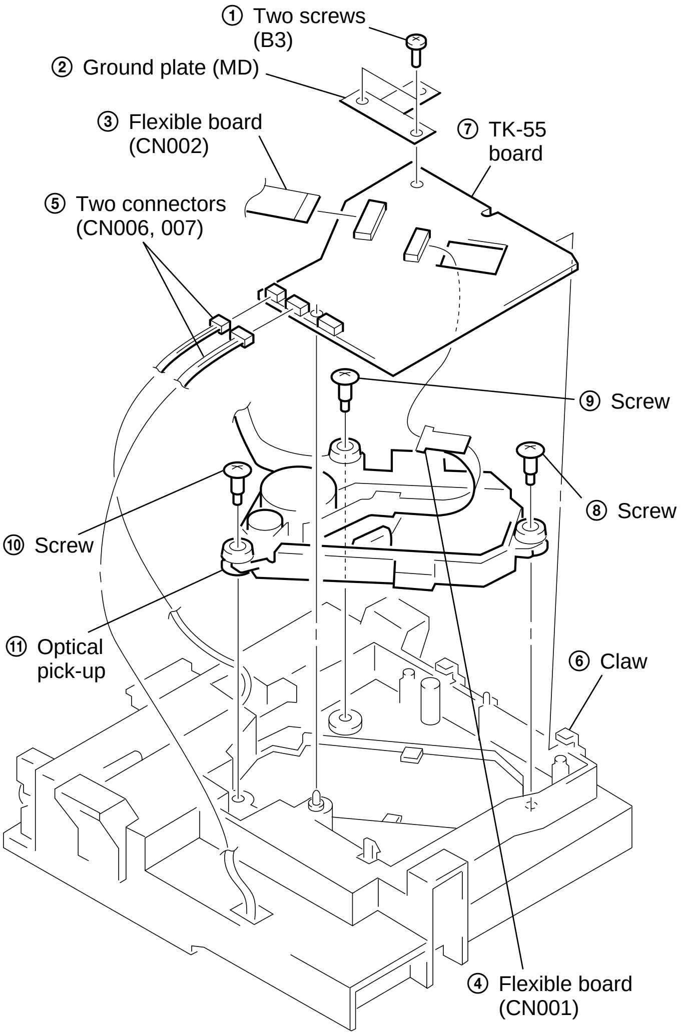
2-7. FRONT PANEL SECTION REMOVAL


⑨ Boss
① Flat cable (CN602)
⑧ Claw
③ Two connectors (CN102, 203)
⑥ Screw (B3) (ring)
④ Screw (B3)
⑦ Claw
⑤ Screw (B3) (ring)
⑩ Front panel section
② Connector (CN501)

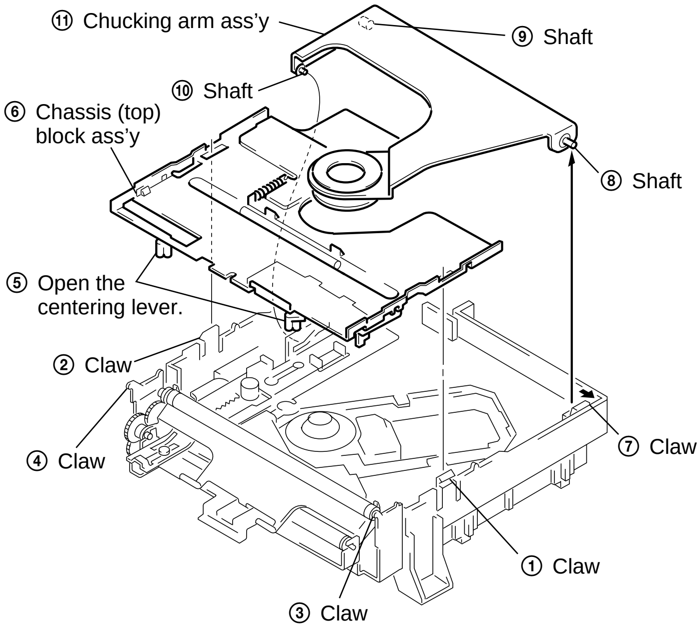
2-8. MD BLOCK ASS’Y REMOVAL


② Three screws (B3)
④ MD block ass’y
⑥ Connector (CN005)
③ Screw (B3)
⑤ Two flat cables (CN003, 004)
① Flat cable (CN101)

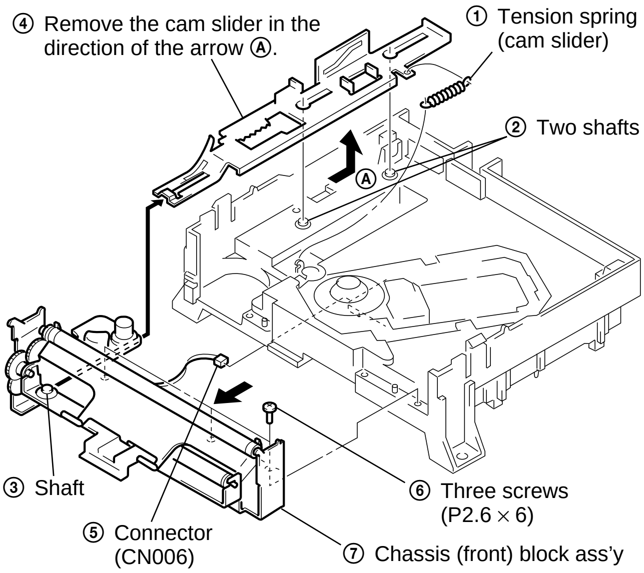
2-9. TK-55 BOARD, OPTICAL PICK-UP REMOVAL


① Two screws (B3)
② Ground plate (MD)
③ Flexible board (CN002)
⑦ TK-55 board
⑤ Two connectors (CN006, 007)
⑨ Screw
⑧ Screw
⑩ Screw
⑪ Optical pick-up
⑥ Claw
④ Flexible board (CN001)

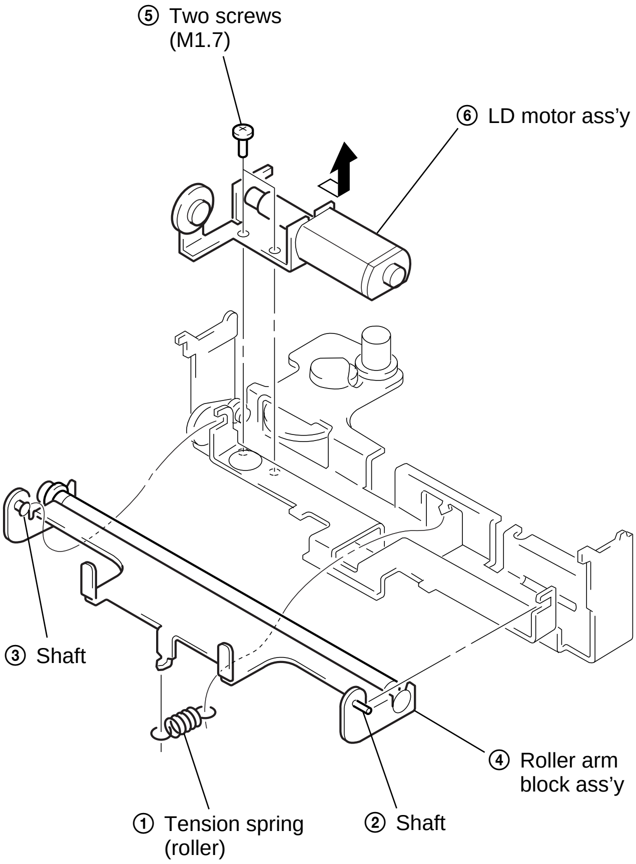
2-10. CHASSIS (TOP) BLOCK ASS’Y, CHUCKING ARM ASS’Y REMOVAL


⑪ Chucking arm ass’y
⑨ Shaft
⑩ Shaft
⑥ Chassis (top) block ass’y
⑧ Shaft
⑤ Open the centering lever.
② Claw
④ Claw
⑦ Claw
① Claw
③ Claw

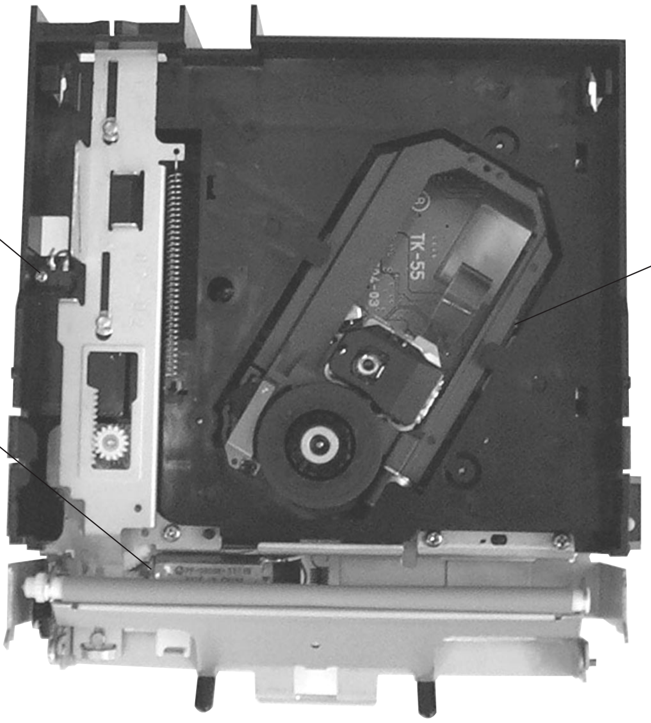
2-11. CAM SLIDER, CHASSIS (FRONT) BLOCK ASS’Y REMOVAL


④ Remove the cam slider in the direction of the arrow Ⓐ.
① Tension spring (cam slider)
② Two shafts
Ⓐ
③ Shaft
⑥ Three screws (P2.6 × 6)
⑤ Connector (CN006)
⑦ Chassis (front) block ass’y

2-12. ROLLER ARM BLOCK ASS’Y, LD MOTOR ASS’Y REMOVAL


⑤ Two screws (M1.7)
⑥ LD motor ass’y
③ Shaft
④ Roller arm block ass’y
① Tension spring (roller)
② Shaft

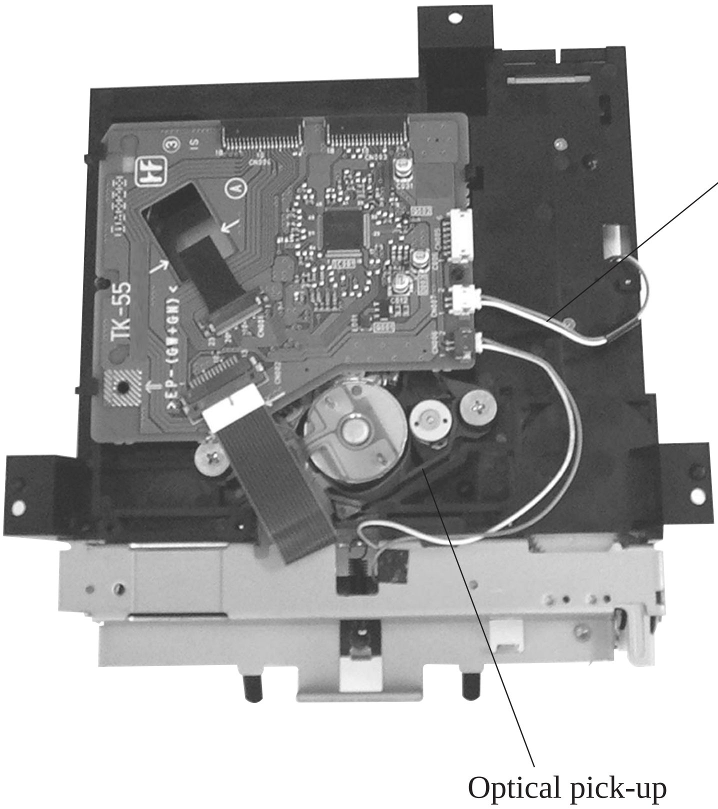
2-13. INTERNAL VIEWS



Switch (chuck sensor)
1-570-771-21

LD motor ass'y
(loading)
A-6062-252-A

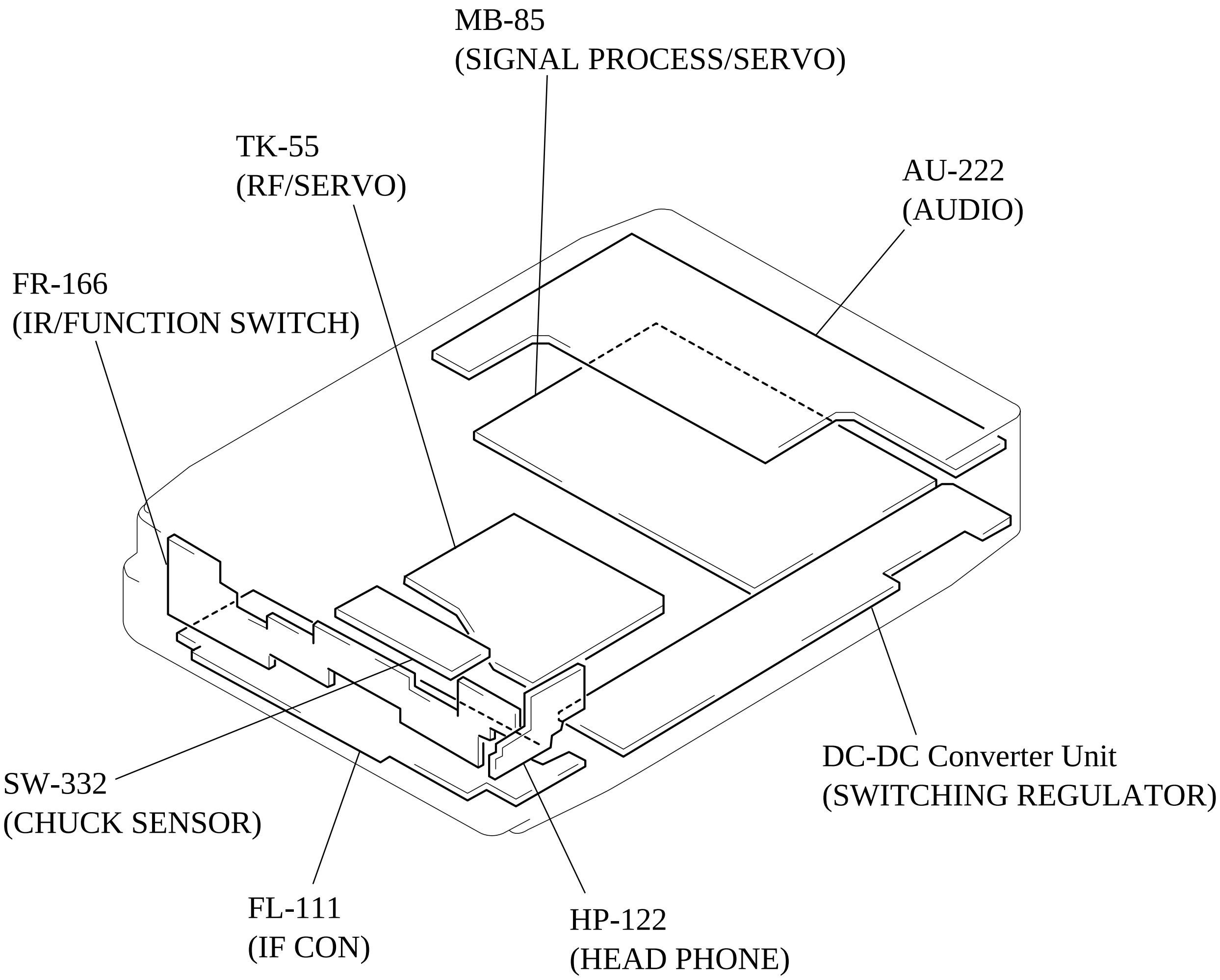
Optical pick-up
(KHM-220AAA/J1RP)
8-820-081-09



Harness (ST-117)
1-960-020-11

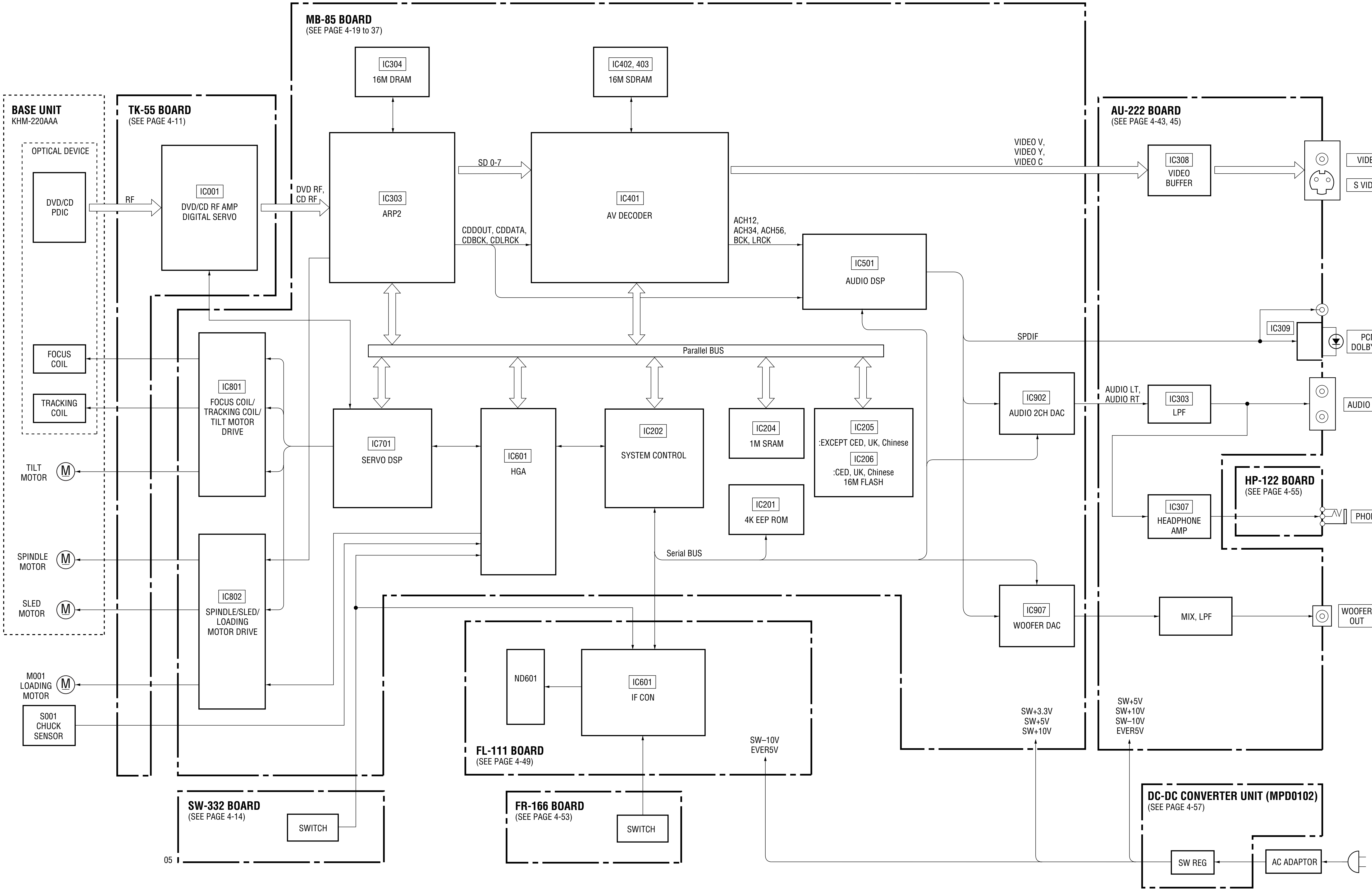
Optical pick-up
(KHM-220AAA/J1RP)
8-820-081-09

2-14. CIRCUIT BOARDS LOCATION

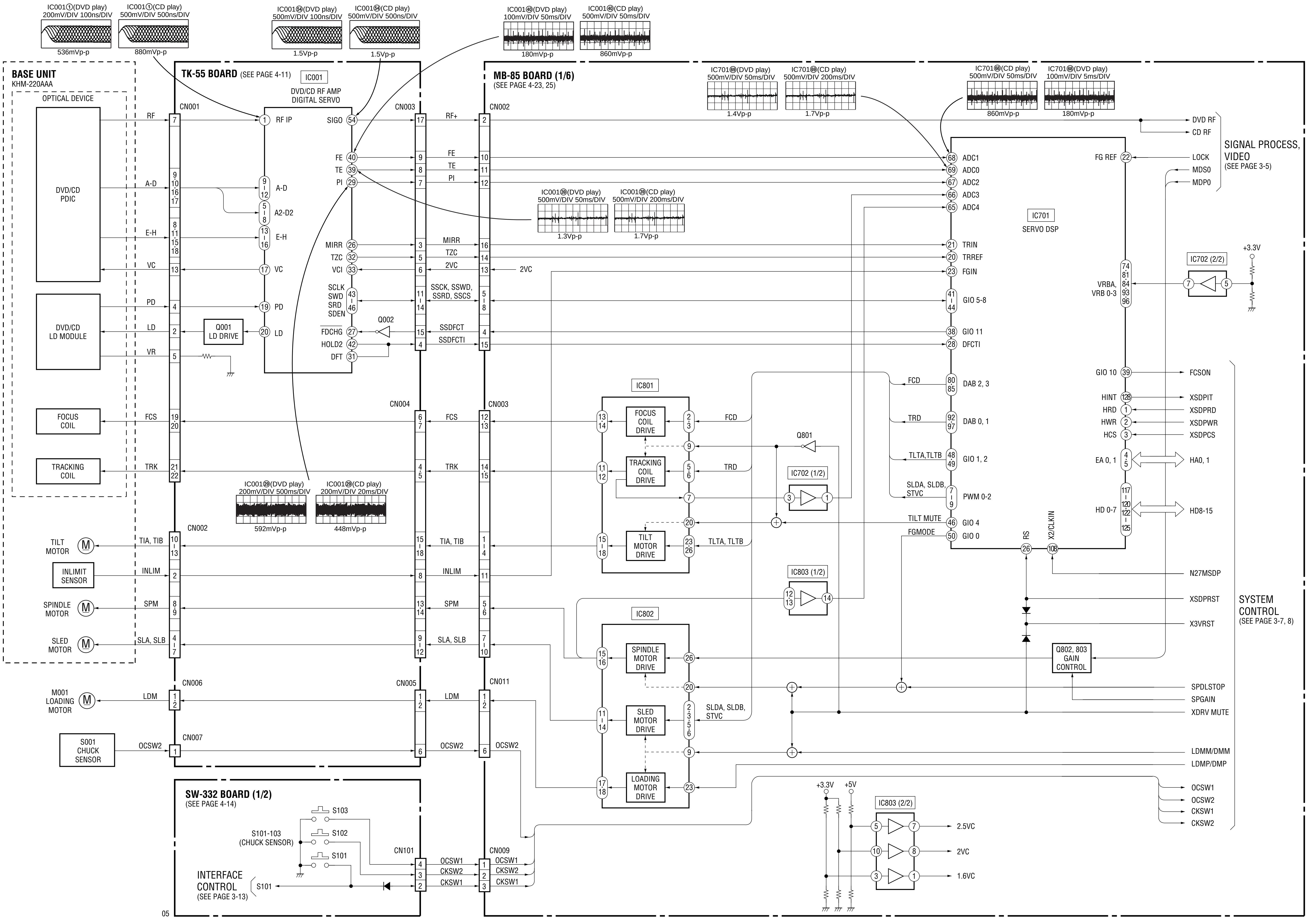

MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

SECTION 3
BLOCK DIAGRAMS

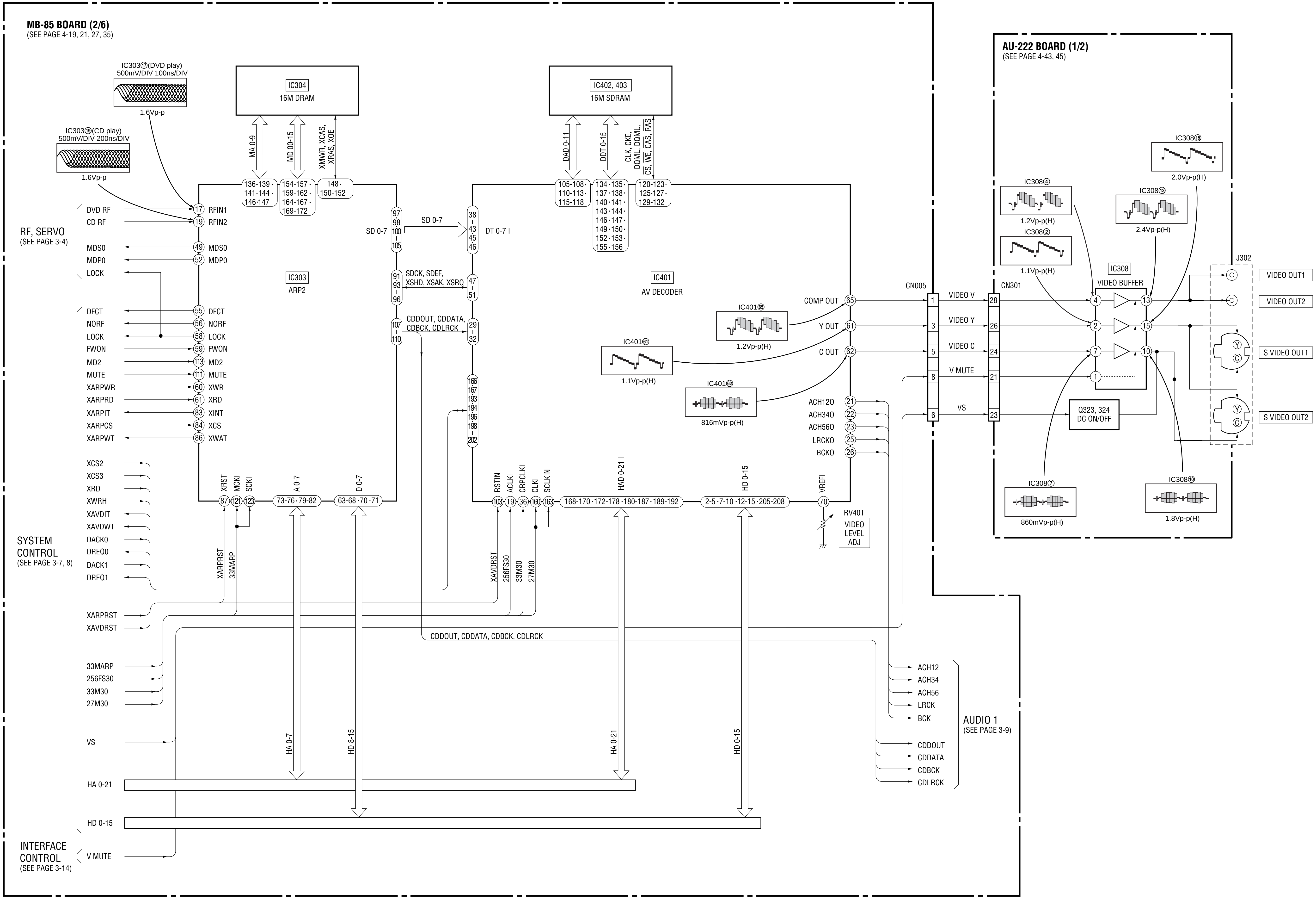
3-1. OVERALL BLOCK DIAGRAM


MB-85 BOARD
(SEE PAGE 4-19 to 37)
IC304
16M DRAM
IC402, 403
16M SDRAM
BASE UNIT
KHM-220AAA
OPTICAL DEVICE
DVD/CD
PDIC
RF
TK-55 BOARD
(SEE PAGE 4-11)
IC001
DVD/CD RF AMP
DIGITAL SERVO
DVD RF,
CD RF
IC303
ARP2
SD 0-7
IC401
AV DECODER
CDDOUT, CDDATA,
CDBCK, CDLRCK
VIDEO V,
VIDEO Y,
VIDEO C
ACH12,
ACH34, ACH56,
BCK, LRCK
IC501
AUDIO DSP
AU-222 BOARD
(SEE PAGE 4-43, 45)
IC308
VIDEO
BUFFER
VIDEO 1, 2
S VIDEO 1, 2
SPDIF
IC309
PCM/DTS/
DOLBY DIGITAL
Parallel BUS
FOCUS
COIL
TRACKING
COIL
IC801
FOCUS COIL/
TRACKING COIL/
TILT MOTOR
DRIVE
IC701
SERVO DSP
IC601
HGA
IC202
SYSTEM CONTROL
IC204
1M SRAM
IC205
:EXCEPT CED, UK, Chinese
IC206
:CED, UK, Chinese
16M FLASH
IC902
AUDIO 2CH DAC
AUDIO LT,
AUDIO RT
IC303
LPF
AUDIO 1, 2
TILT
MOTOR
M
IC201
4K EEP ROM
HP-122 BOARD
(SEE PAGE 4-55)
IC307
HEADPHONE
AMP
PHONES
SPINDLE
MOTOR
M
Serial BUS
SLED
MOTOR
M
IC802
SPINDLE/SLED/
LOADING
MOTOR DRIVE
IC907
WOOFER DAC
MIX, LPF
WOOFER
OUT
ND601
IC601
IF CON
M001
LOADING
MOTOR
M
S001
CHUCK
SENSOR
SW+3.3V
SW+5V
SW+10V
SW+5V
SW+10V
SW−10V
EVER5V
SW−10V
EVER5V
FL-111 BOARD
(SEE PAGE 4-49)
DC-DC CONVERTER UNIT (MPD0102)
(SEE PAGE 4-57)
SW-332 BOARD
(SEE PAGE 4-14)
SWITCH
FR-166 BOARD
(SEE PAGE 4-53)
SWITCH
SW REG
AC ADAPTOR
05

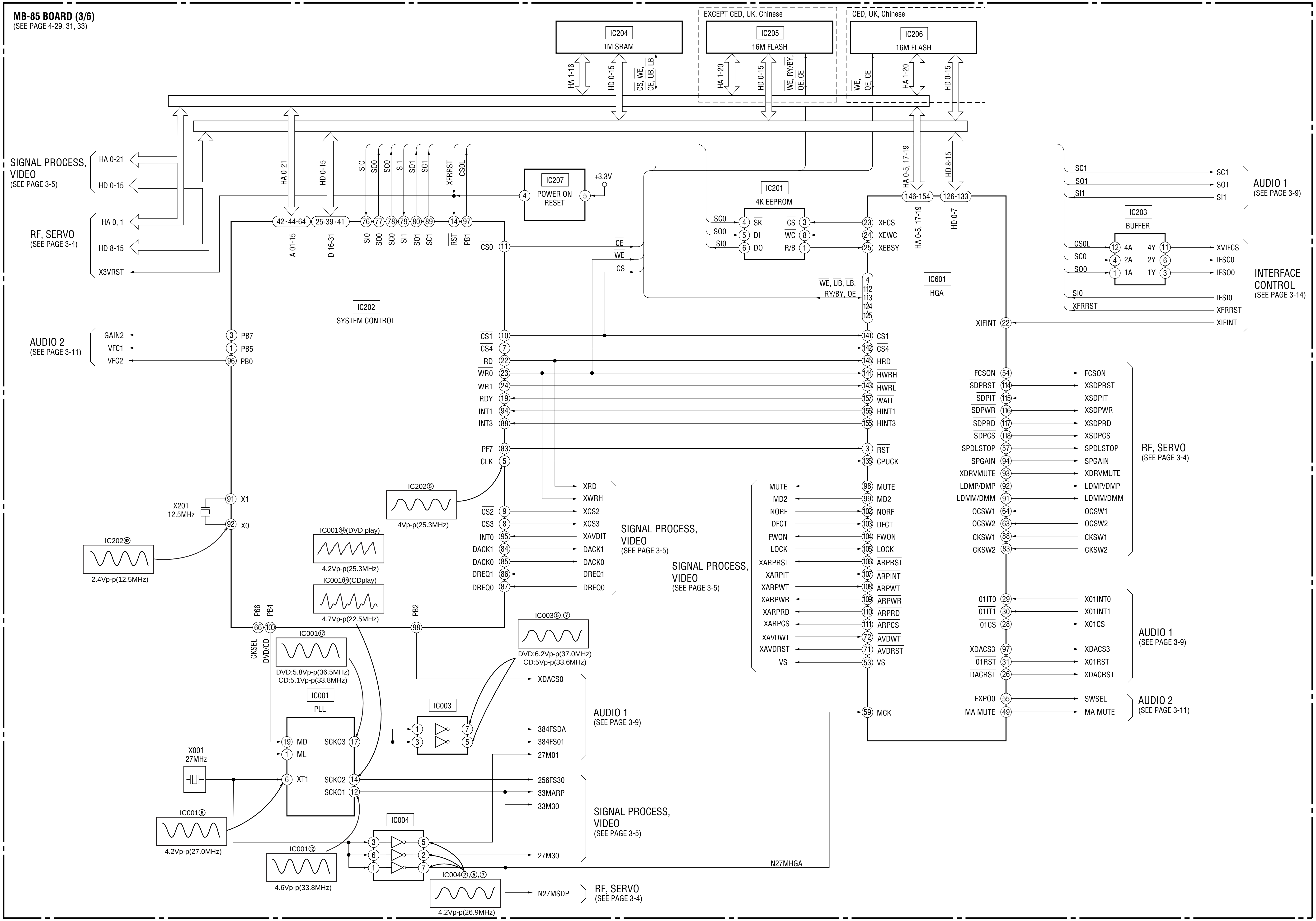
3-2. RF/SERVO BLOCK DIAGRAM


IC001①(DVD play) 200mV/DIV 100ns/DIV
536mVp-p
IC001①(CD play) 500mV/DIV 500ns/DIV
880mVp-p
IC001(54)(DVD play) 500mV/DIV 100ns/DIV
1.5Vp-p
IC001(54)(CD play) 500mV/DIV 500ns/DIV
1.5Vp-p
IC001㊵(DVD play) 100mV/DIV 50ms/DIV
180mVp-p
IC001㊵(CD play) 500mV/DIV 50ms/DIV
860mVp-p
BASE UNIT
KHM-220AAA
OPTICAL DEVICE
DVD/CD PDIC
DVD/CD LD MODULE
FOCUS COIL
TRACKING COIL
RF
A-D
E-H
VC
PD
LD
VR
FCS
TRK
TILT MOTOR
INLIMIT SENSOR
SPINDLE MOTOR
SLED MOTOR
M001 LOADING MOTOR
S001 CHUCK SENSOR
TIA, TIB
INLIM
SPM
SLA, SLB
LDM
OCSW2
TK-55 BOARD (SEE PAGE 4-11)
IC001
DVD/CD RF AMP DIGITAL SERVO
CN001
CN003
CN004
CN002
CN006
CN005
CN007
RF IP
SIGO
FE
TE
PI
A-D
A2-D2
E-H
VC
PD
LD
MIRR
TZC
VCI
SCLK SWD SRD SDEN
FDCHG
HOLD2
DFT
Q001 LD DRIVE
Q002
RF+
2VC
SSCK, SSWD, SSRD, SSCS
SSDFCT
SSDFCTI
IC001㉙(DVD play) 200mV/DIV 500ms/DIV
592mVp-p
IC001㉙(CD play) 200mV/DIV 20ms/DIV
448mVp-p
IC001㊴(DVD play) 500mV/DIV 50ms/DIV
1.3Vp-p
IC001㊴(CD play) 500mV/DIV 200ms/DIV
1.7Vp-p
SW-332 BOARD (1/2) (SEE PAGE 4-14)
S103
S102
S101
S101-103 (CHUCK SENSOR)
CN101
INTERFACE CONTROL (SEE PAGE 3-13)
S101
OCSW1
CKSW2
CKSW1
05
MB-85 BOARD (1/6) (SEE PAGE 4-23, 25)
CN002
CN003
CN011
CN009
IC701㊉(DVD play) 500mV/DIV 50ms/DIV
1.4Vp-p
IC701㊉(CD play) 500mV/DIV 200ms/DIV
1.7Vp-p
IC701㊇(CD play) 500mV/DIV 50ms/DIV
860mVp-p
IC701㊇(DVD play) 100mV/DIV 5ms/DIV
180mVp-p
IC701 SERVO DSP
ADC1
ADC0
ADC2
ADC3
ADC4
TRIN
TRREF
FGIN
GIO 5-8
GIO 11
DFCTI
DAB 2, 3
DAB 0, 1
GIO 1, 2
PWM 0-2
GIO 4
GIO 0
FG REF
VRBA, VRB 0-3
GIO 10
HINT
HRD
HWR
HCS
EA 0, 1
HD 0-7
RS
X2/CLKIN
FCD
TRD
TLTA,TLTB
SLDA, SLDB, STVC
TILT MUTE
FGMODE
IC702 (2/2)
+3.3V
IC801
FOCUS COIL DRIVE
TRACKING COIL DRIVE
TILT MOTOR DRIVE
Q801
IC702 (1/2)
IC803 (1/2)
TLTA, TLTB
IC802
SPINDLE MOTOR DRIVE
SLED MOTOR DRIVE
LOADING MOTOR DRIVE
SLDA, SLDB, STVC
Q802, 803 GAIN CONTROL
IC803 (2/2)
+3.3V
+5V
2.5VC
2VC
1.6VC
DVD RF
CD RF
LOCK
MDS0
MDP0
SIGNAL PROCESS, VIDEO (SEE PAGE 3-5)
FCSON
XSDPIT
XSDPRD
XSDPWR
XSDPCS
HA0, 1
HD8-15
N27MSDP
XSDPRST
X3VRST
SYSTEM CONTROL (SEE PAGE 3-7, 8)
SPDLSTOP
SPGAIN
XDRV MUTE
LDMM/DMM
LDMP/DMP
OCSW1
OCSW2
CKSW1
CKSW2

3-3. SIGNAL PROCESS/VIDEO BLOCK DIAGRAM

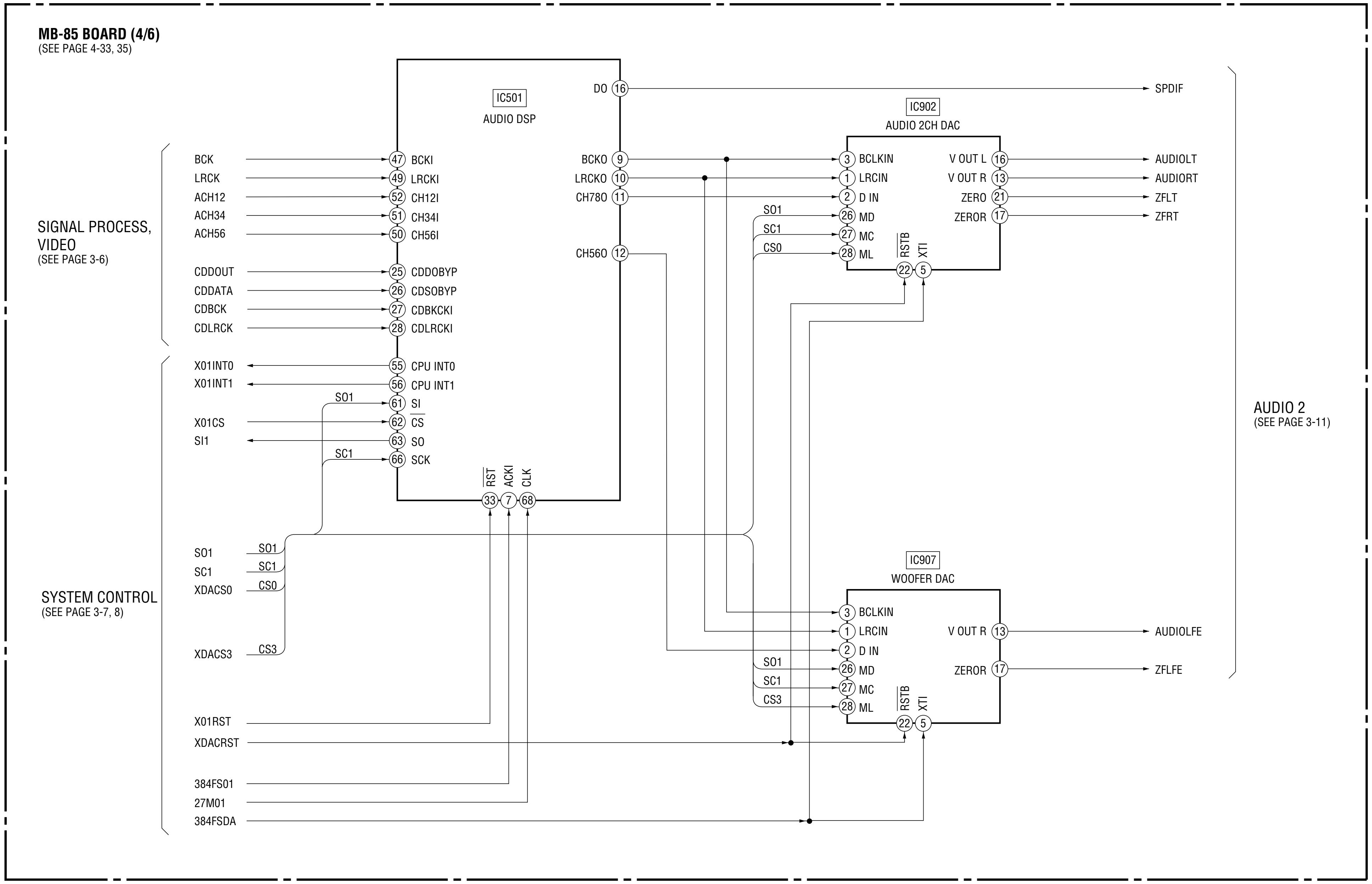

MB-85 BOARD (2/6)
(SEE PAGE 4-19, 21, 27, 35)
IC303⑰(DVD play)
500mV/DIV 100ns/DIV
1.6Vp-p
IC303⑲(CD play)
500mV/DIV 200ns/DIV
1.6Vp-p
IC304
16M DRAM
IC402, 403
16M SDRAM
MA 0-9
MD 00-15
XMWR, XCAS, XRAS, XOE
DAD 0-11
DDT 0-15
CLK, CKE, DQML, DQMU, CS, WE, CAS, RAS
136-139 · 141-144 · 146-147
154-157 · 159-162 · 164-167 · 169-172
148 · 150-152
105-108 · 110-113 · 115-118
134 · 135 · 137 · 138 · 140 · 141 · 143 · 144 · 146 · 147 · 149 · 150 · 152 · 153 · 155 · 156
120-123 · 125-127 · 129-132
RF, SERVO
(SEE PAGE 3-4)
DVD RF
CD RF
MDS0
MDP0
LOCK
17 RFIN1
19 RFIN2
49 MDS0
52 MDP0
IC303
ARP2
SD 0-7
97 98 100 – 105
SD 0-7
38 – 43 45 – 46
DT 0-7 I
91 93 – 96
SDCK, SDEF, XSHD, XSAK, XSRQ
47 – 51
107 – 110
CDDOUT, CDDATA, CDBCK, CDLRCK
29 – 32
166 167 193 194 196 198 – 202
IC401
AV DECODER
DFCT
NORF
LOCK
FWON
MD2
MUTE
XARPWR
XARPRD
XARPIT
XARPCS
XARPWT
55 DFCT
56 NORF
58 LOCK
59 FWON
113 MD2
111 MUTE
60 XWR
61 XRD
83 XINT
84 XCS
86 XWAT
XCS2
XCS3
XRD
XWRH
XAVDIT
XAVDWT
DACK0
DREQ0
DACK1
DREQ1
SYSTEM CONTROL
(SEE PAGE 3-7, 8)
XARPRST
XAVDRST
XRST
MCKI
SCKI
A 0-7
D 0-7
87 121 123
73-76 · 79-82
63-68 · 70 · 71
XARPRST
33MARP
RSTIN
ACLKI
CRPCLKI
CLKI
SCLKIN
HAD 0-21 I
HD 0-15
VREFI
103 19 36 160 163
168-170 · 172-178 · 180-187 · 189-192
2-5 · 7-10 · 12-15 · 205-208
70
XAVDRST
256FS30
33M30
27M30
RV401
VIDEO LEVEL ADJ
CDDOUT, CDDATA, CDBCK, CDLRCK
33MARP
256FS30
33M30
27M30
VS
HA 0-7
HD 8-15
HA 0-21
HD 0-15
HA 0-21
HD 0-15
INTERFACE CONTROL
(SEE PAGE 3-14)
V MUTE
IC401⑥⑤
1.2Vp-p(H)
IC401⑥①
1.1Vp-p(H)
IC401⑥②
816mVp-p(H)
COMP OUT 65
Y OUT 61
C OUT 62
ACH12O 21
ACH34O 22
ACH56O 23
LRCKO 25
BCKO 26
ACH12
ACH34
ACH56
LRCK
BCK
CDDOUT
CDDATA
CDBCK
CDLRCK
AUDIO 1
(SEE PAGE 3-9)
CN005
VIDEO V
VIDEO Y
VIDEO C
V MUTE
VS
CN301
AU-222 BOARD (1/2)
(SEE PAGE 4-43, 45)
IC308④
1.2Vp-p(H)
IC308②
1.1Vp-p(H)
IC308⑬
2.4Vp-p(H)
IC308⑮
2.0Vp-p(H)
IC308
VIDEO BUFFER
Q323, 324
DC ON/OFF
IC308⑦
860mVp-p(H)
IC308⑩
1.8Vp-p(H)
J302
VIDEO OUT1
VIDEO OUT2
S VIDEO OUT1
S VIDEO OUT2
Y
C

3-4. SYSTEM CONTROL BLOCK DIAGRAM


MB-85 BOARD (3/6)
(SEE PAGE 4-29, 31, 33)
IC204
1M SRAM
EXCEPT CED, UK, Chinese
IC205
16M FLASH
CED, UK, Chinese
IC206
16M FLASH
HA 1-16
HD 0-15
CS, WE, OE, UB, LB
HA 1-20
HD 0-15
WE, RY/BY, OE, CE
WE, OE, CE
HA 1-20
HD 0-15
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-5)
HA 0-21
HD 0-15
RF, SERVO
(SEE PAGE 3-4)
HA 0, 1
HD 8-15
X3VRST
HA 0-21
HD 0-15
SI0
SO0
SC0
SI1
SO1
SC1
XFRRST
CS0L
IC207
POWER ON RESET
+3.3V
4
5
IC201
4K EEPROM
SC0
SO0
SI0
4 SK
5 DI
6 DO
CS 3
WC 8
R/B 1
23 XECS
24 XEWC
25 XEBSY
HA 0-5, 17-19
HD 8-15
146-154
126-133
HA 0-5, 17-19
HD 0-7
SC1
SO1
SI1
SC1
SO1
SI1
AUDIO 1
(SEE PAGE 3-9)
IC203
BUFFER
CS0L
SC0
SO0
12 4A 4Y 11
4 2A 2Y 6
1 1A 1Y 3
XVIFCS
IFSC0
IFSO0
SI0
XFRRST
IFSI0
XFRRST
XIFINT
INTERFACE CONTROL
(SEE PAGE 3-14)
42·44-64
25-39·41
76 77 78 79 80 89
14 97
A 01-15
D 16-31
SI0 SO0 SC0 SI1 SO1 SC1
RST PB1
CS0 11
CE
WE
CS
WE, UB, LB, RY/BY, OE
4 112 113 124 125
IC601
HGA
XIFINT 22
IC202
SYSTEM CONTROL
AUDIO 2
(SEE PAGE 3-11)
GAIN2
VFC1
VFC2
3 PB7
1 PB5
96 PB0
CS1 10
CS4 7
RD 22
WR0 23
WR1 24
RDY 19
INT1 94
INT3 88
PF7 83
CLK 5
141 CS1
142 CS4
145 HRD
144 HWRH
143 HWRL
157 WAIT
156 HINT1
155 HINT3
3 RST
135 CPUCK
FCSON 54
SDPRST 114
SDPIT 115
SDPWR 116
SDPRD 117
SDPCS 118
SPDLSTOP 57
SPGAIN 94
XDRVMUTE 93
LDMP/DMP 92
LDMM/DMM 91
OCSW1 64
OCSW2 63
CKSW1 88
CKSW2 83
FCSON
XSDPRST
XSDPIT
XSDPWR
XSDPRD
XSDPCS
SPDLSTOP
SPGAIN
XDRVMUTE
LDMP/DMP
LDMM/DMM
OCSW1
OCSW2
CKSW1
CKSW2
RF, SERVO
(SEE PAGE 3-4)
X201
12.5MHz
91 X1
92 X0
IC202⑤
4Vp-p(25.3MHz)
IC202㉒
2.4Vp-p(12.5MHz)
XRD
XWRH
CS2 9
CS3 8
INT0 95
DACK1 84
DACK0 85
DREQ1 86
DREQ0 87
XCS2
XCS3
XAVDIT
DACK1
DACK0
DREQ1
DREQ0
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-5)
IC001⑭(DVD play)
4.2Vp-p(25.3MHz)
IC001⑭(CDplay)
4.7Vp-p(22.5MHz)
MUTE
MD2
NORF
DFCT
FWON
LOCK
XARPRST
XARPIT
XARPWT
XARPWR
XARPRD
XARPCS
XAVDWT
XAVDRST
VS
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-5)
98 MUTE
99 MD2
102 NORF
103 DFCT
104 FWON
105 LOCK
106 ARPRST
107 ARPINT
108 ARPWT
109 ARPWR
110 ARPRD
111 ARPCS
72 AVDWT
71 AVDRST
53 VS
01IT0 29
01IT1 30
01CS 28
XDACS3 97
01RST 31
DACRST 26
X01INT0
X01INT1
X01CS
XDACS3
X01RST
XDACRST
AUDIO 1
(SEE PAGE 3-9)
EXPO0 55
MA MUTE 49
SWSEL
MA MUTE
AUDIO 2
(SEE PAGE 3-11)
59 MCK
P66
PB4
66 100
PB2
98
CKSEL
DVD/CD
IC001⑰
DVD:5.8Vp-p(36.5MHz)
CD:5.1Vp-p(33.8MHz)
IC003⑤,⑦
DVD:6.2Vp-p(37.0MHz)
CD:5Vp-p(33.6MHz)
XDACS0
IC001
PLL
19 MD
1 ML
6 XT1
SCKO3 17
SCKO2 14
SCKO1 12
IC003
1 7
3 5
384FSDA
384FS01
27M01
AUDIO 1
(SEE PAGE 3-9)
X001
27MHz
256FS30
33MARP
33M30
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-5)
IC001⑥
4.2Vp-p(27.0MHz)
IC004
3 5
6 2
1 7
27M30
N27MHGA
IC001⑫
4.6Vp-p(33.8MHz)
IC004②,⑤,⑦
4.2Vp-p(26.9MHz)
N27MSDP
RF, SERVO
(SEE PAGE 3-4)

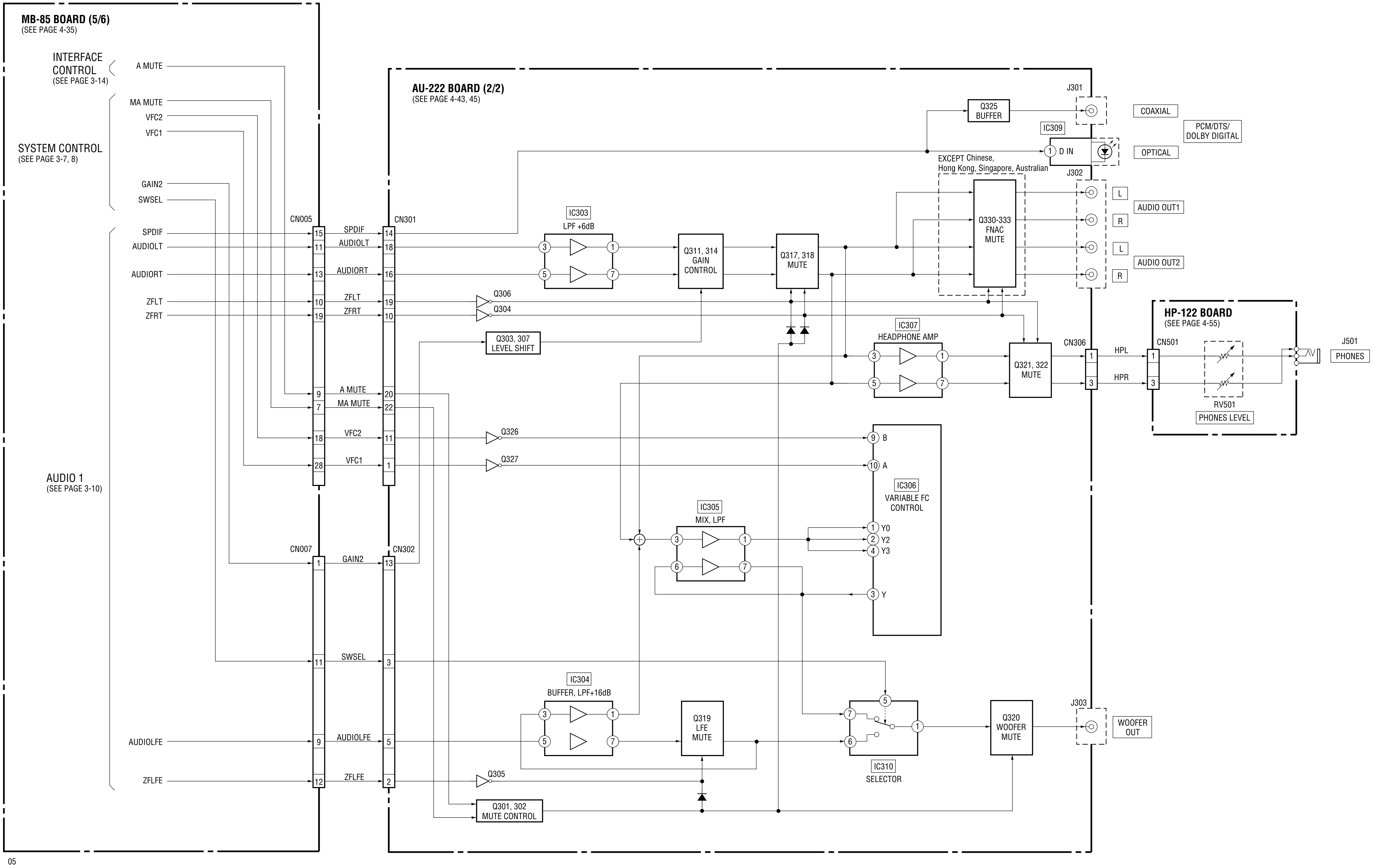
05

3-5. AUDIO (1) BLOCK DIAGRAM

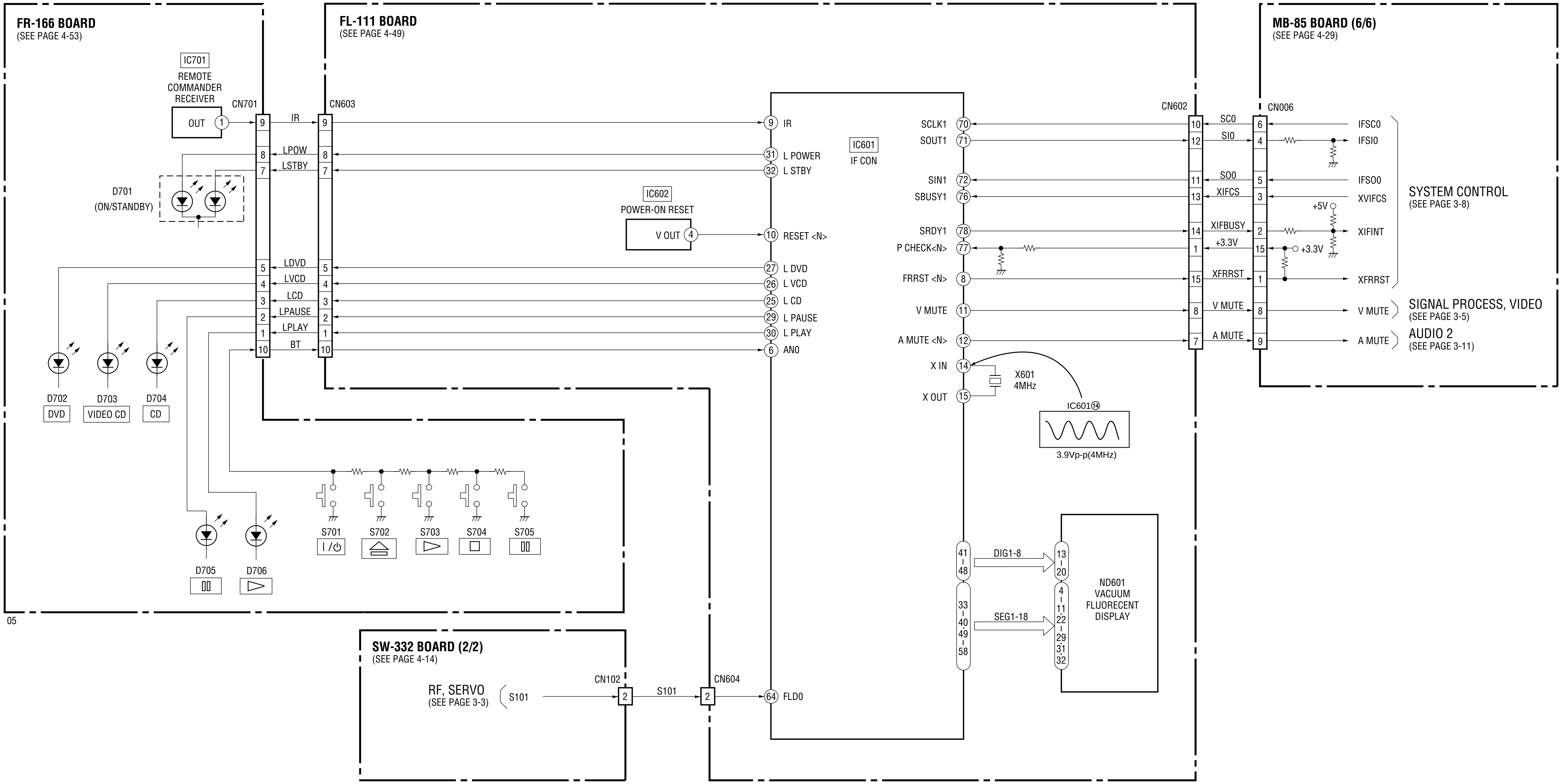

MB-85 BOARD (4/6)
(SEE PAGE 4-33, 35)
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-6)
SYSTEM CONTROL
(SEE PAGE 3-7, 8)
AUDIO 2
(SEE PAGE 3-11)
IC501
AUDIO DSP
IC902
AUDIO 2CH DAC
IC907
WOOFER DAC
BCK
LRCK
ACH12
ACH34
ACH56
CDDOUT
CDDATA
CDBCK
CDLRCK
X01INT0
X01INT1
X01CS
SI1
SO1
SC1
XDACS0
XDACS3
X01RST
XDACRST
384FS01
27M01
384FSDA
47 BCKI
49 LRCKI
52 CH12I
51 CH34I
50 CH56I
25 CDDOBYP
26 CDSOBYP
27 CDBKCKI
28 CDLRCKI
55 CPU INT0
56 CPU INT1
61 SI
62 CS
63 SO
66 SCK
33 RST
7 ACKI
68 CLK
DO 16
BCKO 9
LRCKO 10
CH78O 11
CH56O 12
3 BCLKIN
1 LRCIN
2 D IN
26 MD
27 MC
28 ML
22 RSTB
5 XTI
V OUT L 16
V OUT R 13
ZERO 21
ZEROR 17
SO1
SC1
CS0
CS3
SPDIF
AUDIOLT
AUDIORT
ZFLT
ZFRT
AUDIOLFE
ZFLFE

05

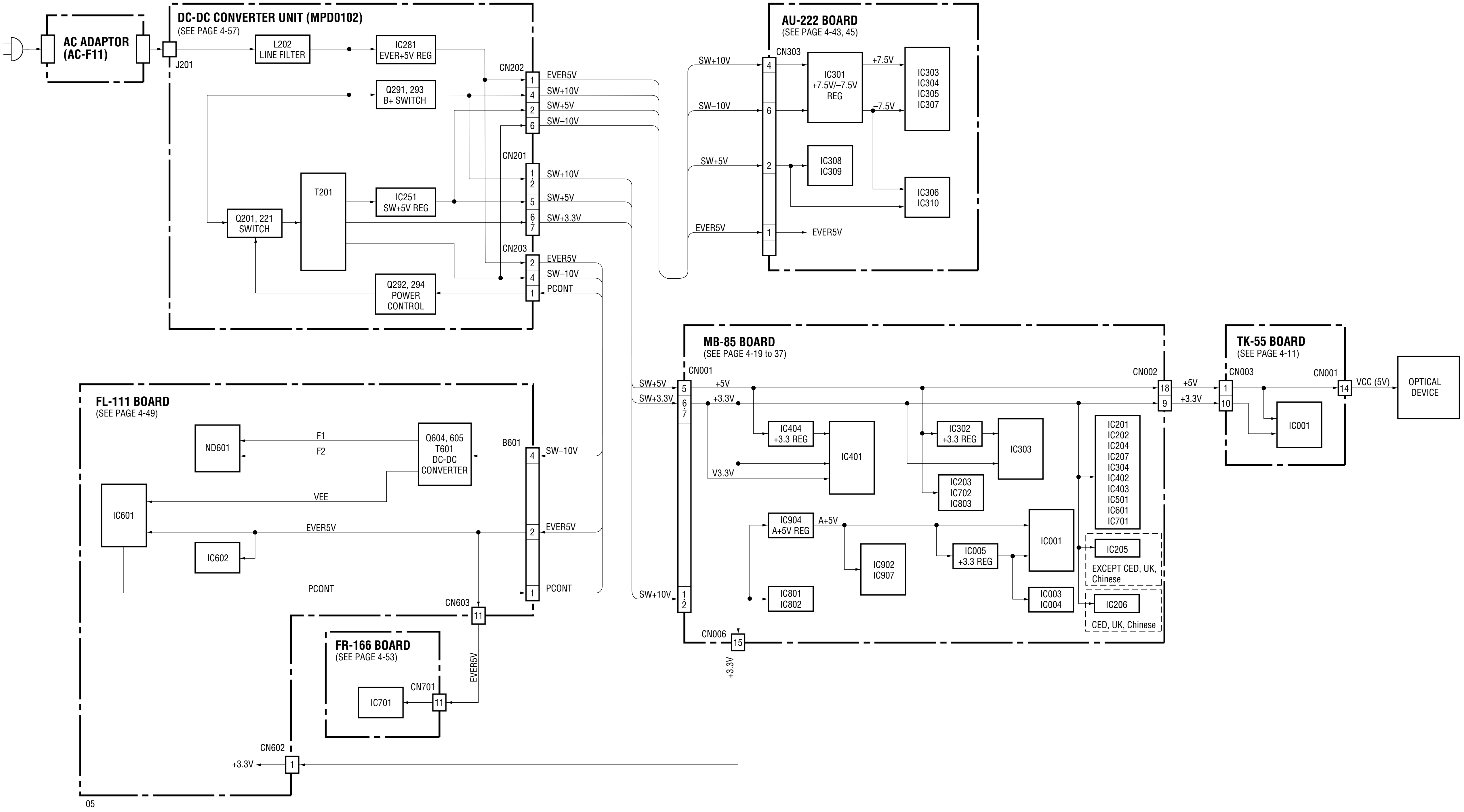
3-6. AUDIO (2) BLOCK DIAGRAM


MB-85 BOARD (5/6)
(SEE PAGE 4-35)
INTERFACE CONTROL
(SEE PAGE 3-14)
A MUTE
SYSTEM CONTROL
(SEE PAGE 3-7, 8)
MA MUTE
VFC2
VFC1
GAIN2
SWSEL
SPDIF
AUDIOLT
AUDIORT
ZFLT
ZFRT
AUDIO 1
(SEE PAGE 3-10)
AUDIOLFE
ZFLFE
CN005
CN007
CN301
CN302
AU-222 BOARD (2/2)
(SEE PAGE 4-43, 45)
Q325
BUFFER
IC309
D IN
J301
COAXIAL
OPTICAL
PCM/DTS/
DOLBY DIGITAL
EXCEPT Chinese,
Hong Kong, Singapore, Australian
J302
Q330-333
FNAC
MUTE
L
R
AUDIO OUT1
AUDIO OUT2
IC303
LPF +6dB
Q311, 314
GAIN
CONTROL
Q317, 318
MUTE
Q306
Q304
Q303, 307
LEVEL SHIFT
IC307
HEADPHONE AMP
Q321, 322
MUTE
CN306
HPL
HPR
HP-122 BOARD
(SEE PAGE 4-55)
CN501
RV501
PHONES LEVEL
J501
PHONES
Q326
Q327
IC306
VARIABLE FC
CONTROL
B
A
Y0
Y2
Y3
Y
IC305
MIX, LPF
IC304
BUFFER, LPF+16dB
Q319
LFE
MUTE
Q305
Q301, 302
MUTE CONTROL
IC310
SELECTOR
Q320
WOOFER
MUTE
J303
WOOFER
OUT
05

3-7. INTERFACE CONTROL BLOCK DIAGRAM


FR-166 BOARD
(SEE PAGE 4-53)
IC701
REMOTE
COMMANDER
RECEIVER
OUT
1
CN701
D701
(ON/STANDBY)
9
8
7
5
4
3
2
1
10
IR
LPOW
LSTBY
LDVD
LVCD
LCD
LPAUSE
LPLAY
BT
D702
DVD
D703
VIDEO CD
D704
CD
S701
S702
S703
S704
S705
D705
D706
05
FL-111 BOARD
(SEE PAGE 4-49)
CN603
IC602
POWER-ON RESET
V OUT
4
9 IR
31 L POWER
32 L STBY
10 RESET <N>
27 L DVD
26 L VCD
25 L CD
29 L PAUSE
30 L PLAY
6 AN0
IC601
IF CON
SCLK1 70
SOUT1 71
SIN1 72
SBUSY1 76
SRDY1 78
P CHECK<N> 77
FRRST <N> 8
V MUTE 11
A MUTE <N> 12
X IN 14
X OUT 15
X601
4MHz
IC601⑭
3.9Vp-p(4MHz)
41
48
33
40
49
58
DIG1-8
SEG1-18
13
20
4
11
22
29
31
32
ND601
VACUUM
FLUORECENT
DISPLAY
64 FLD0
CN604
2
S101
CN602
10
12
11
13
14
1
15
8
7
SC0
SI0
SO0
XIFCS
XIFBUSY
+3.3V
XFRRST
V MUTE
A MUTE
MB-85 BOARD (6/6)
(SEE PAGE 4-29)
CN006
6
4
5
3
2
15
1
8
9
IFSC0
IFSI0
IFSO0
XVIFCS
+5V
XIFINT
+3.3V
XFRRST
V MUTE
A MUTE
SYSTEM CONTROL
(SEE PAGE 3-8)
SIGNAL PROCESS, VIDEO
(SEE PAGE 3-5)
AUDIO 2
(SEE PAGE 3-11)
SW-332 BOARD (2/2)
(SEE PAGE 4-14)
RF, SERVO
(SEE PAGE 3-3)
S101
CN102
2

3-8. POWER BLOCK DIAGRAM


AC ADAPTOR
(AC-F11)
DC-DC CONVERTER UNIT (MPD0102)
(SEE PAGE 4-57)
J201
L202
LINE FILTER
IC281
EVER+5V REG
Q291, 293
B+ SWITCH
T201
Q201, 221
SWITCH
IC251
SW+5V REG
Q292, 294
POWER
CONTROL
CN202
EVER5V
SW+10V
SW+5V
SW–10V
CN201
SW+10V
SW+5V
SW+3.3V
CN203
EVER5V
SW–10V
PCONT
AU-222 BOARD
(SEE PAGE 4-43, 45)
CN303
SW+10V
SW–10V
SW+5V
EVER5V
IC301
+7.5V/–7.5V
REG
+7.5V
–7.5V
IC303
IC304
IC305
IC307
IC308
IC309
IC306
IC310
EVER5V
MB-85 BOARD
(SEE PAGE 4-19 to 37)
CN001
SW+5V
SW+3.3V
+5V
+3.3V
V3.3V
IC404
+3.3 REG
IC401
IC302
+3.3 REG
IC303
IC203
IC702
IC803
IC201
IC202
IC204
IC207
IC304
IC402
IC403
IC501
IC601
IC701
IC904
A+5V REG
A+5V
IC902
IC907
IC005
+3.3 REG
IC001
IC205
EXCEPT CED, UK,
Chinese
IC206
CED, UK, Chinese
IC801
IC802
IC003
IC004
SW+10V
CN002
CN006
+3.3V
TK-55 BOARD
(SEE PAGE 4-11)
CN003
CN001
+5V
+3.3V
IC001
VCC (5V)
OPTICAL
DEVICE
FL-111 BOARD
(SEE PAGE 4-49)
ND601
F1
F2
Q604, 605
T601
DC-DC
CONVERTER
B601
SW–10V
IC601
VEE
EVER5V
IC602
PCONT
EVER5V
PCONT
CN603
FR-166 BOARD
(SEE PAGE 4-53)
IC701
CN701
EVER5V
CN602
+3.3V
05

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:
- ○—— : indicates a lead wire mounted on the component side.
- ●—— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

For schematic Diagram:
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, $^{1}/_{4}$ W (Chip resistors : $^{1}/_{10}$ W) unless otherwise specified.
  kΩ : 1000 Ω, MΩ : 1000 kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- B+ : B+ Line.
- B– : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10 MΩ).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

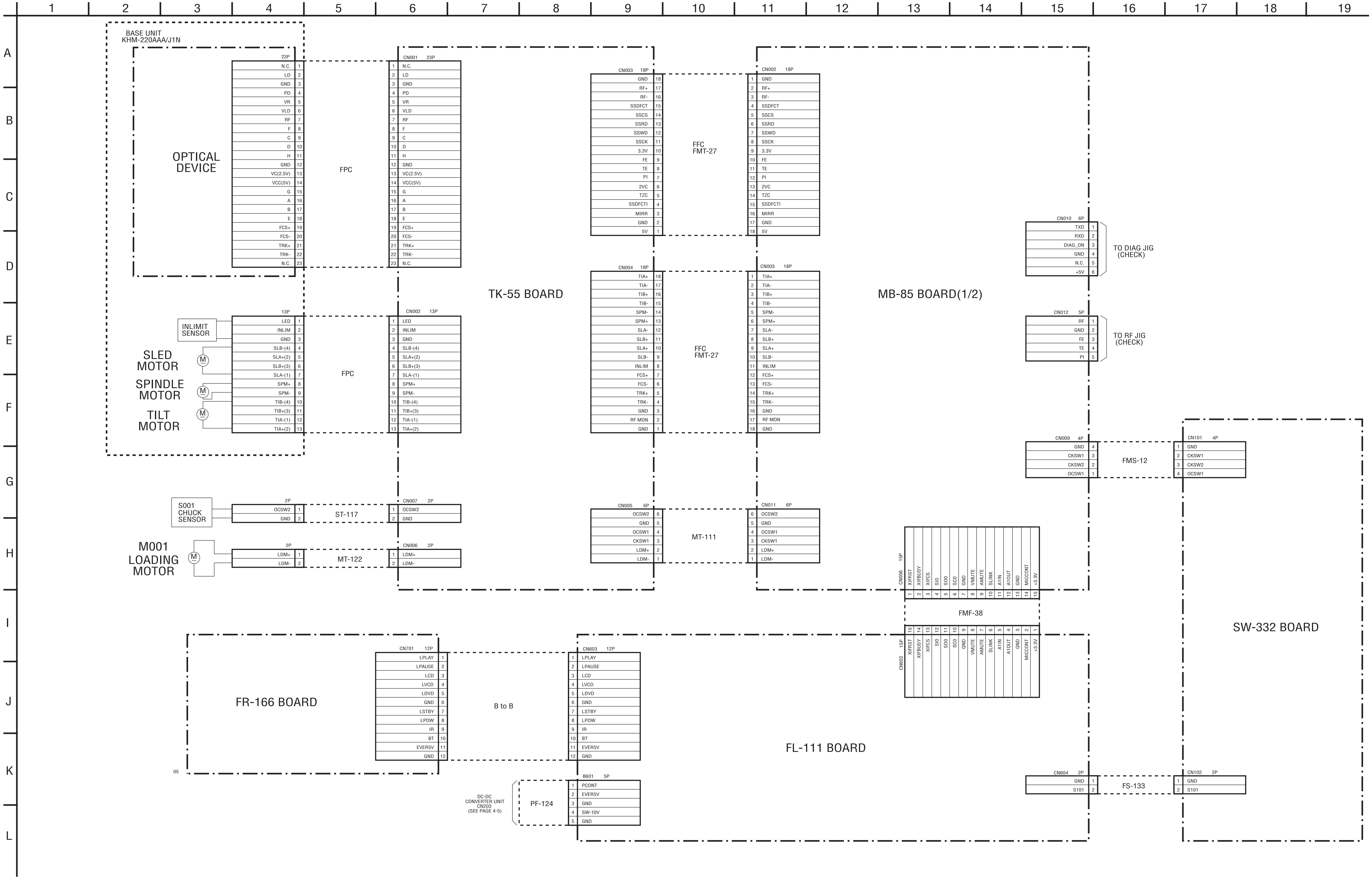
When indicating parts by reference number, please include the board name.

- Abbreviation

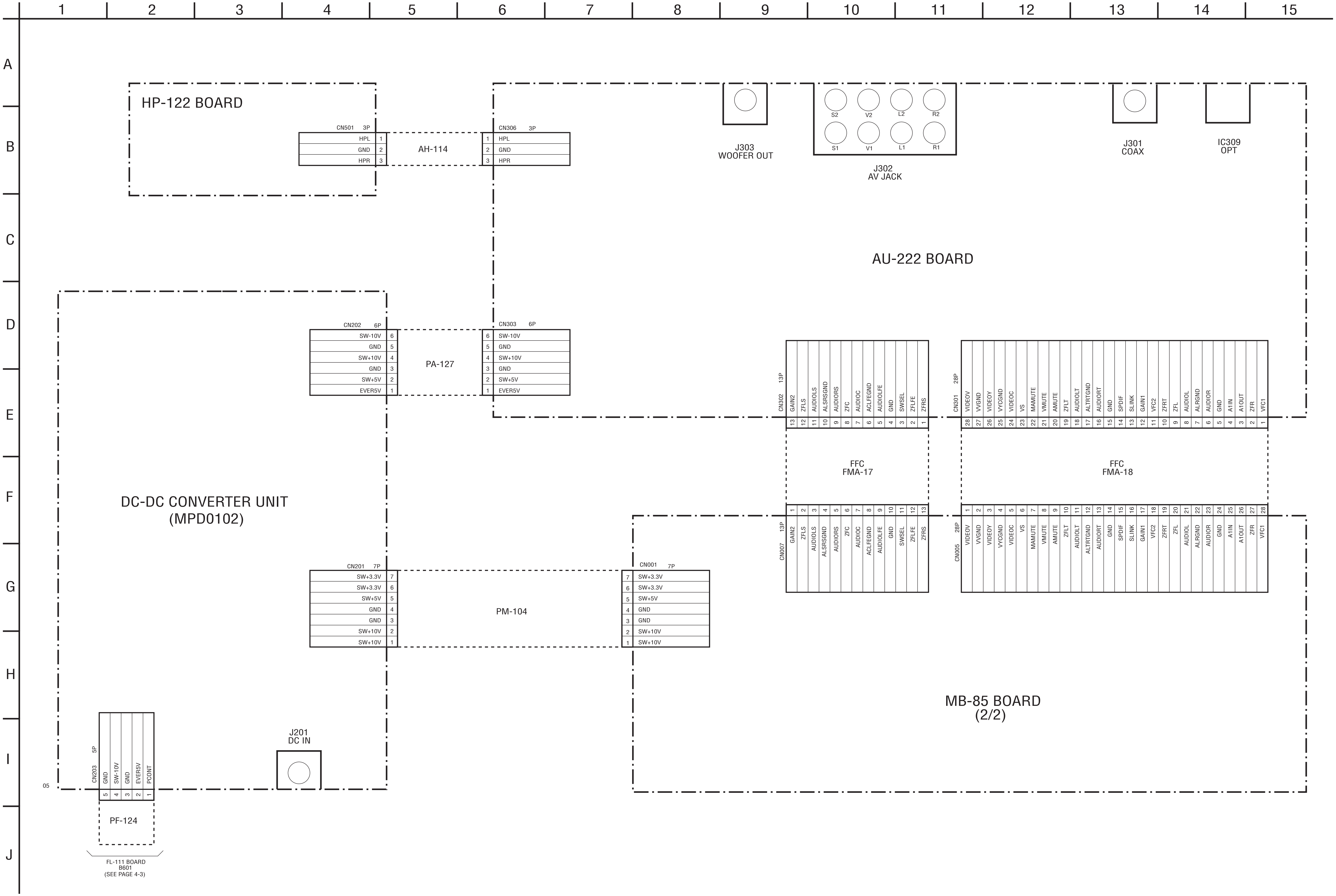
AUS	: Australian model
CN	: Chinese model
HK	: Hong Kong model
SP	: Singapore model

4-1. FRAME SCHEMATIC DIAGRAM

FRAME (1) SCHEMATIC DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
A B C D E F G H I J K L
BASE UNIT
KHM-220AAA/J1N
OPTICAL DEVICE
23P
N.C. LD GND PD VR VLD RF F C D H GND VC(2.5V) VCC(5V) G A B E FCS+ FCS- TRK+ TRK- N.C.
FPC
CN001 23P
INLIMIT SENSOR
SLED MOTOR
SPINDLE MOTOR
TILT MOTOR
M
13P
LED INLIM GND SLB-(4) SLA+(2) SLB+(3) SLA-(1) SPM+ SPM- TIB-(4) TIB+(3) TIA-(1) TIA+(2)
FPC
CN002 13P
S001 CHUCK SENSOR
2P
OCSW2 GND
ST-117
CN007 2P
M001 LOADING MOTOR
2P
LDM+ LDM-
MT-122
CN006 2P
TK-55 BOARD
CN003 18P
GND RF+ RF- SSDFCT SSCS SSRD SSWD SSCK 3.3V FE TE PI 2VC TZC SSDFCTI MIRR GND 5V
FFC FMT-27
CN002 18P
CN004 18P
TIA+ TIA- TIB+ TIB- SPM- SPM+ SLA- SLB+ SLA+ SLB- INLIM FCS+ FCS- TRK+ TRK- GND RF MON GND
FFC FMT-27
CN003 18P
CN005 6P
OCSW2 GND OCSW1 CKSW1 LDM+ LDM-
MT-111
CN011 6P
MB-85 BOARD(1/2)
CN010 6P
TXD RXD DIAG_ON GND N.C. +5V
TO DIAG JIG (CHECK)
CN012 5P
RF GND FE TE PI
TO RF JIG (CHECK)
CN009 4P
GND CKSW1 CKSW2 OCSW1
FMS-12
CN101 4P
SW-332 BOARD
CN006 15P
XIFRST XIFBUSY XIFCS SI0 SO0 SC0 GND VMUTE AMUTE SLINK A1IN A1OUT GND MICCONT +3.3V
FMF-38
CN602 15P
FR-166 BOARD
CN701 12P
LPLAY LPAUSE LCD LVCD LDVD GND LSTBY LPOW IR BT EVER5V GND
B to B
CN603 12P
FL-111 BOARD
05
DC-DC CONVERTER UNIT CN203 (SEE PAGE 4-5)
PF-124
B601 5P
PCONT EVER5V GND SW-10V GND
CN604 2P
GND S101
FS-133
CN102 2P

FRAME (2) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
HP-122 BOARD
CN501 3P
HPL 1
GND 2
HPR 3
AH-114
CN306 3P
1 HPL
2 GND
3 HPR
J303
WOOFER OUT
S2
V2
L2
R2
S1
V1
L1
R1
J302
AV JACK
J301
COAX
IC309
OPT
AU-222 BOARD
CN202 6P
SW-10V 6
GND 5
SW+10V 4
GND 3
SW+5V 2
EVER5V 1
PA-127
CN303 6P
6 SW-10V
5 GND
4 SW+10V
3 GND
2 SW+5V
1 EVER5V
CN302 13P
GAIN2 13
ZFLS 12
AUDIOLS 11
ALSRSGND 10
AUDIORS 9
ZFC 8
AUDIOC 7
ACLFEGND 6
AUDIOLFE 5
GND 4
SWSEL 3
ZFLFE 2
ZFRS 1
CN301 28P
VIDEOV 28
VVGND 27
VIDEOY 26
VYCGND 25
VIDEOC 24
VS 23
MAMUTE 22
VMUTE 21
AMUTE 20
ZFLT 19
AUDIOLT 18
ALTRTGND 17
AUDIORT 16
GND 15
SPDIF 14
SLINK 13
GAIN1 12
VFC2 11
ZFRT 10
ZFL 9
AUDIOL 8
ALRGND 7
AUDIOR 6
GND 5
A1IN 4
A1OUT 3
ZFR 2
VFC1 1
FFC
FMA-17
FFC
FMA-18
CN007 13P
1 GAIN2
2 ZFLS
3 AUDIOLS
4 ALSRSGND
5 AUDIORS
6 ZFC
7 AUDIOC
8 ACLFEGND
9 AUDIOLFE
10 GND
11 SWSEL
12 ZFLFE
13 ZFRS
CN005 28P
1 VIDEOV
2 VVGND
3 VIDEOY
4 VYCGND
5 VIDEOC
6 VS
7 MAMUTE
8 VMUTE
9 AMUTE
10 ZFLT
11 AUDIOLT
12 ALTRTGND
13 AUDIORT
14 GND
15 SPDIF
16 SLINK
17 GAIN1
18 VFC2
19 ZFRT
20 ZFL
21 AUDIOL
22 ALRGND
23 AUDIOR
24 GND
25 A1IN
26 A1OUT
27 ZFR
28 VFC1
DC-DC CONVERTER UNIT
(MPD0102)
CN201 7P
SW+3.3V 7
SW+3.3V 6
SW+5V 5
GND 4
GND 3
SW+10V 2
SW+10V 1
PM-104
CN001 7P
7 SW+3.3V
6 SW+3.3V
5 SW+5V
4 GND
3 GND
2 SW+10V
1 SW+10V
MB-85 BOARD
(2/2)
J201
DC IN
CN203 5P
GND 5
SW-10V 4
GND 3
EVER5V 2
PCONT 1
05
PF-124
FL-111 BOARD
B601
(SEE PAGE 4-3)

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

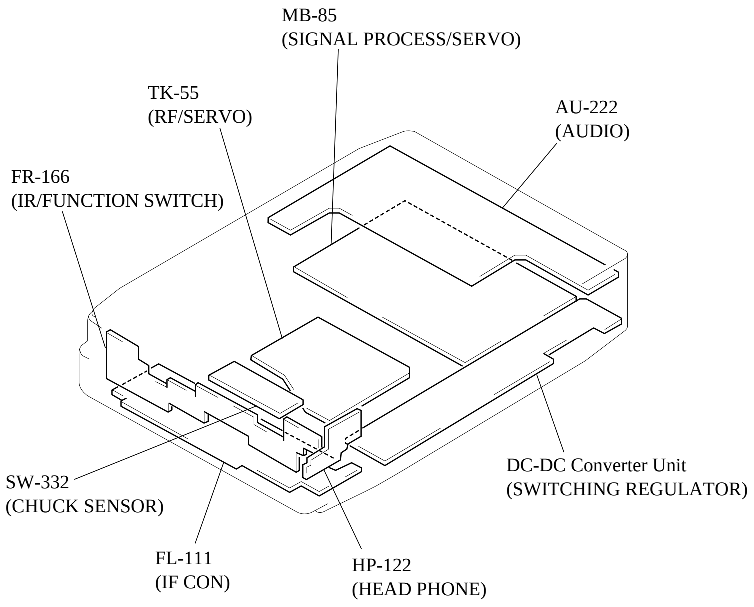
TK-55 (RF/SERVO) PRINTED WIRING BOARD

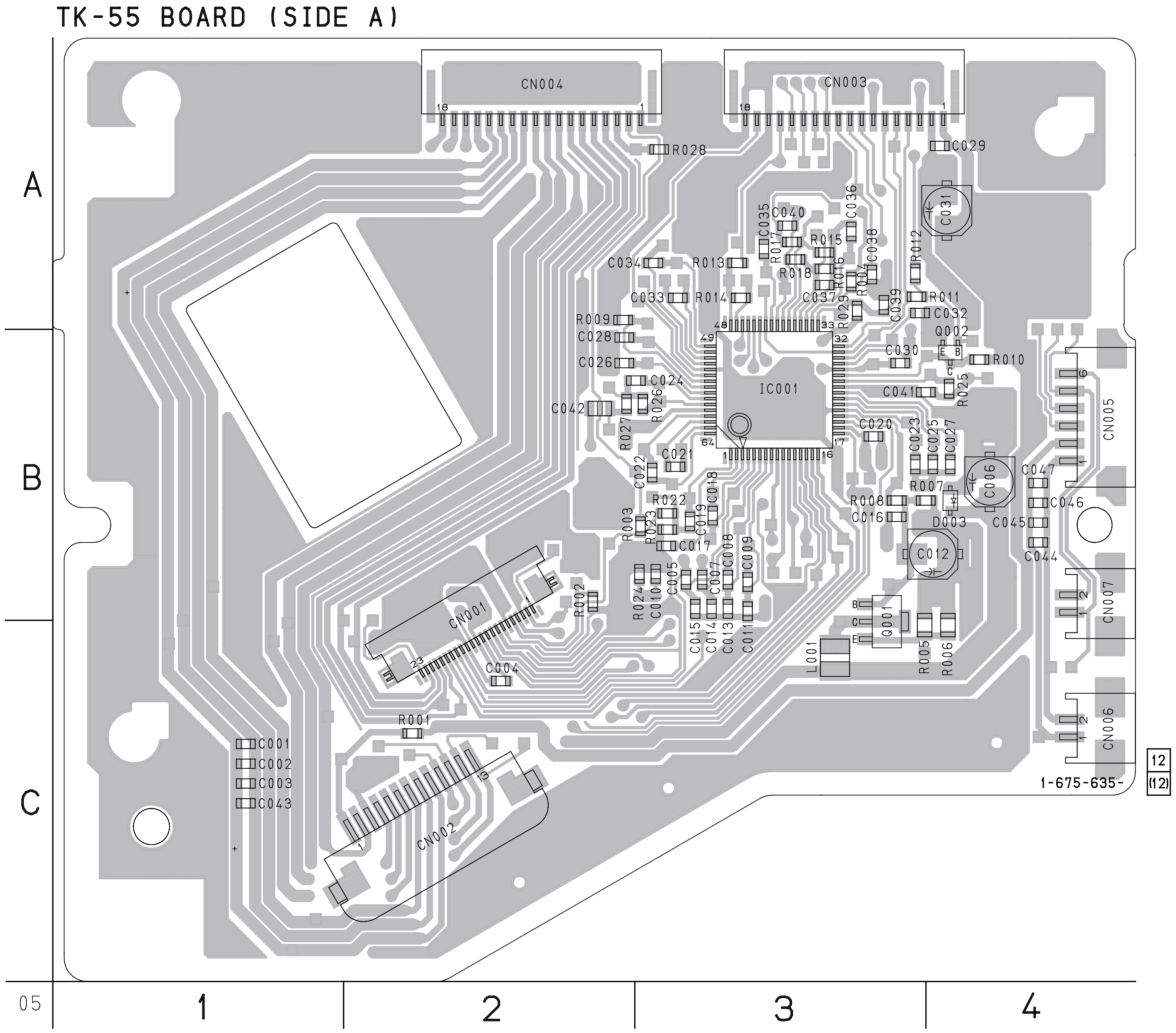
– Ref. No.: TK-55 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

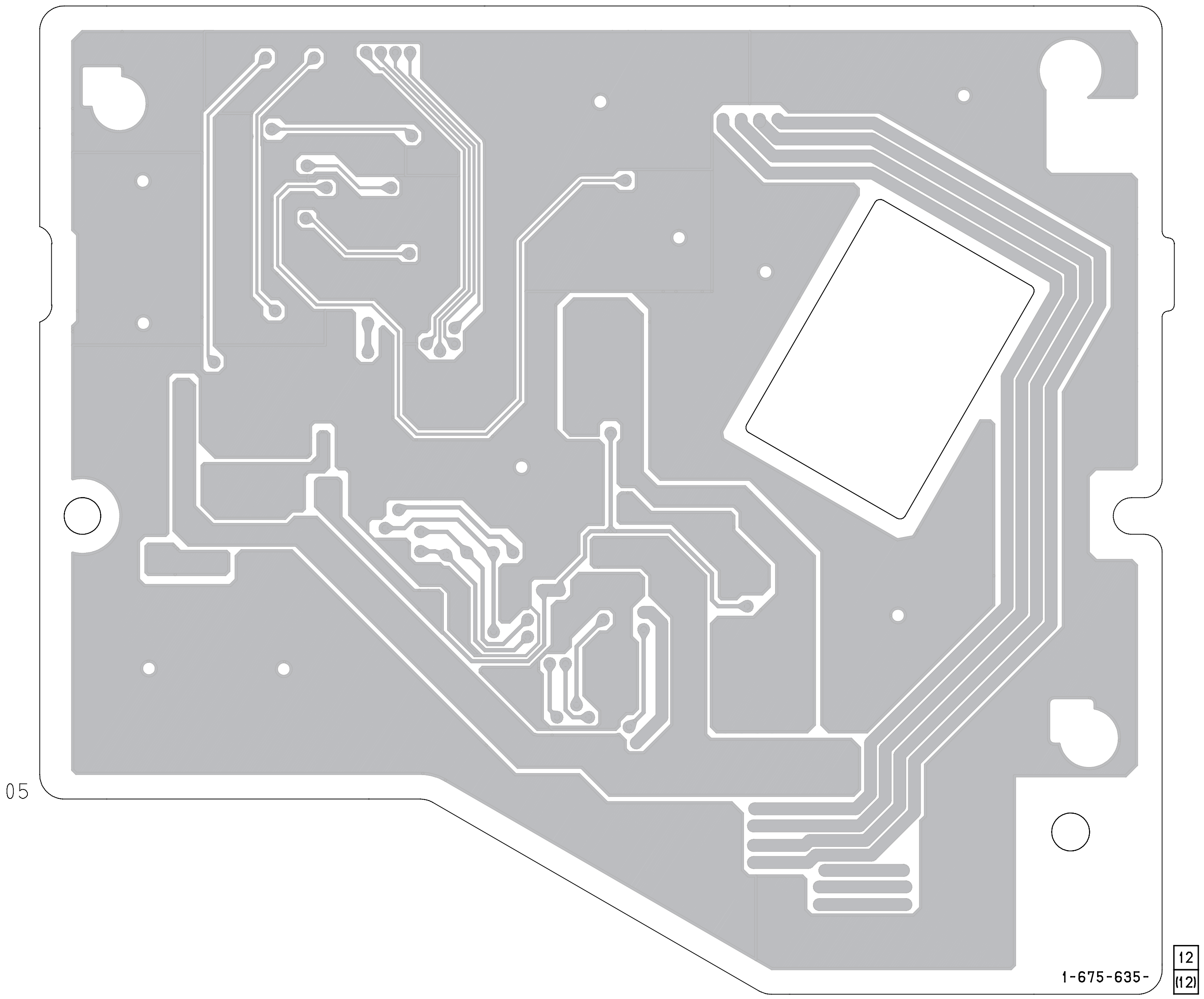
TK-55 BOARD (SIDE A)

CN001	C-2
CN002	C-2
CN003	A-3
CN004	A-2
CN005	B-4
CN006	C-4
CN007	B-4
D003	B-4
IC001	B-3
Q001	C-3
Q002	B-4


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

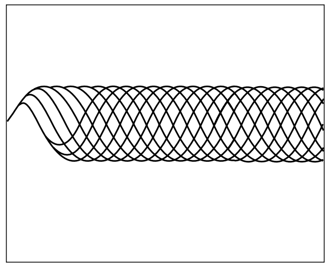

TK-55 BOARD (SIDE A)
A
B
C
1
2
3
4
05
CN004
CN003
CN001
CN002
CN005
CN006
CN007
IC001
Q001
Q002
D003
L001
R028
C029
C031
C035
C040
C036
R015
R017
R016
C038
R012
C034
R013
R018
C033
R014
C037
R029
R011
C039
C032
R009
C028
C026
C024
C030
R010
R026
C041
R025
C042
R027
C020
C023
C025
C027
C021
C022
C018
R022
C019
C047
C006
R007
R008
C016
C046
C045
C044
C012
R003
R023
C017
C008
C009
C005
C007
C010
C024
R024
R002
C015
C014
C013
C011
C004
R005
R006
R001
C001
C002
C003
C043
1-675-635-
12
(12)

TK-55 BOARD (SIDE B)



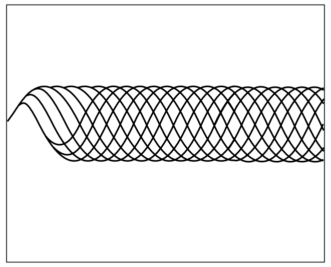
• Waveforms

❶ IC001 ① (DVD play)
200 mV/DIV 100 ns/DIV



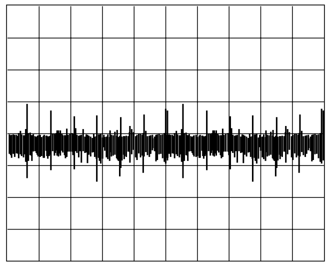
536 mVp-p

❷ IC001 ① (CD play)
500 mV/DIV 500 ns/DIV



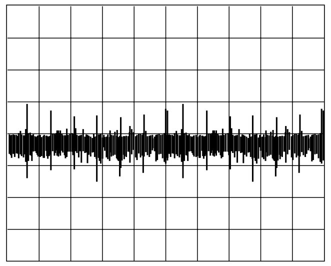
880 mVp-p

❸ IC001 ㉙ (DVD play)
200 mV/DIV 500 ms/DIV



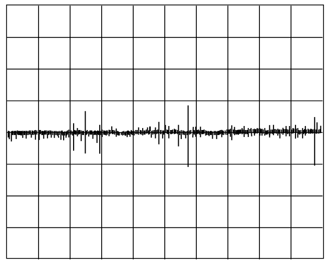
592 mVp-p

❹ IC001 ㉙ (CD play)
200 mV/DIV 20 ms/DIV



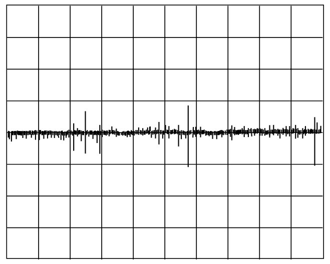
448 mVp-p

❺ IC001 ㊴ (DVD play)
500 mV/DIV 50 ms/DIV



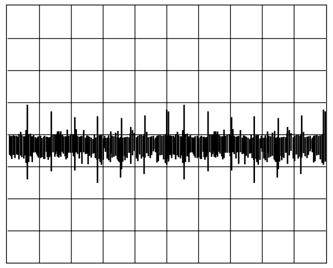
1.3 Vp-p

❻ IC001 ㊴ (CD play)
500 mV/DIV 200 ms/DIV



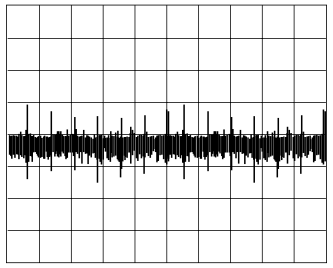
1.7 Vp-p

❼ IC001 ㊵ (DVD play)
100 mV/DIV 50 ms/DIV



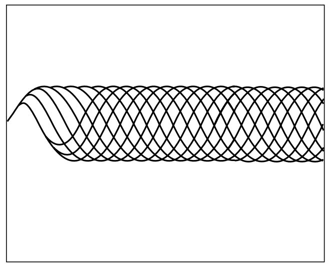
180 mVp-p

❽ IC001 ㊵ (CD play)
500 mV/DIV 50 ms/DIV



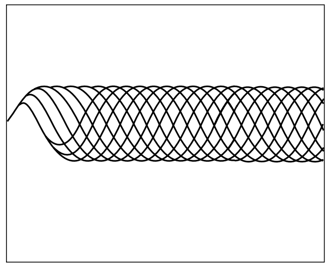
860 mVp-p

❾ IC001 (54) (DVD play)
500 mV/DIV 100 ns/DIV



1.5 Vp-p

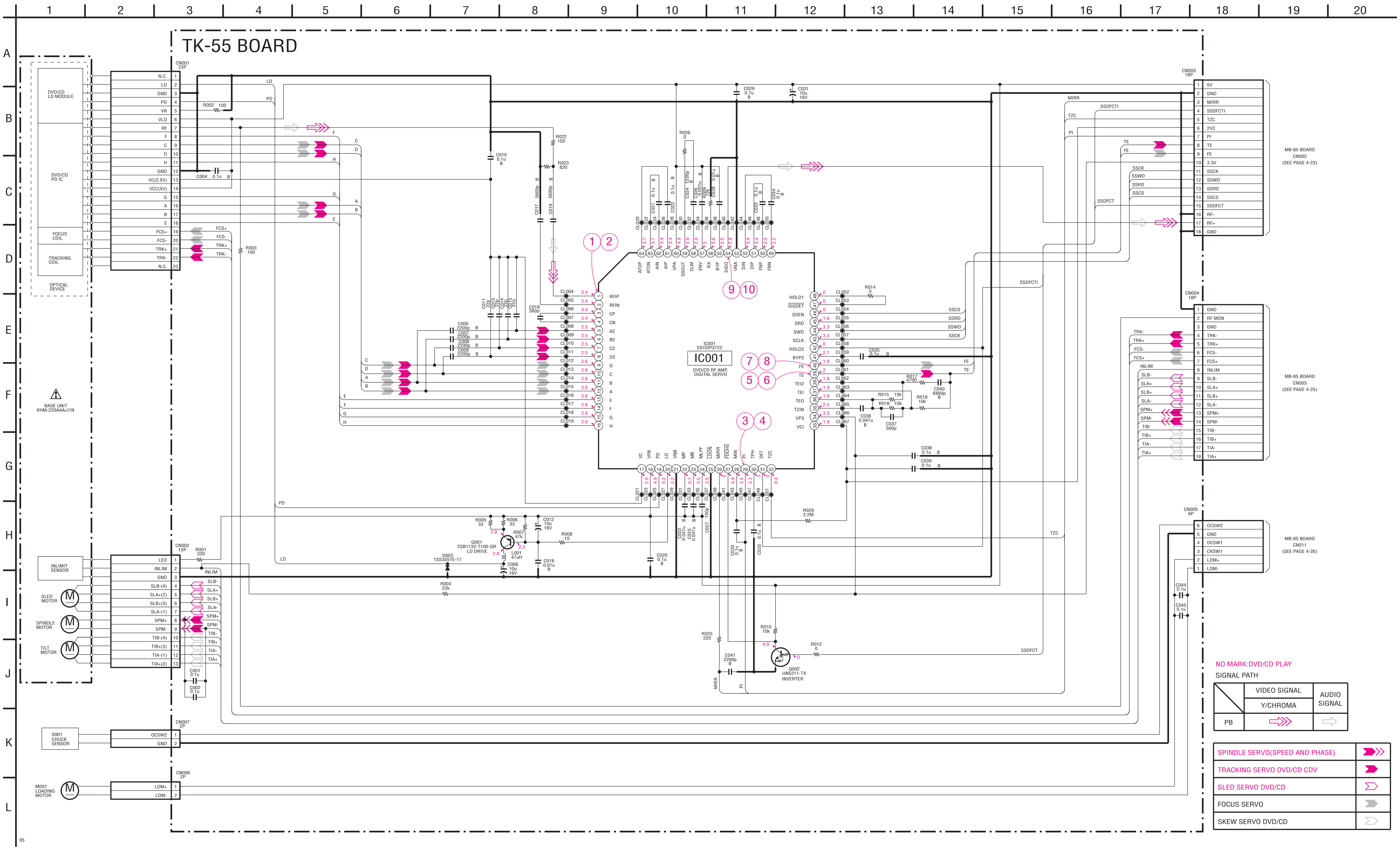
❿ IC001 (54) (CD play)
500 mV/DIV 500 ns/DIV



1.5 Vp-p

TK-55 (RF/SERVO) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board and page 4-10 for waveforms.

– Ref. No.: TK-55 board; 2,000 series –


TK-55 BOARD
CN001 23P
N.C.
LD
GND
PD
VR
VLD
RF
F
C
D
H
GND
VC(2.5V)
VCC(5V)
G
A
B
E
FCS+
FCS-
TRK+
TRK-
N.C.
DVD/CD LD MODULE
DVD/CD PD IC
FOCUS COIL
TRACKING COIL
OPTICAL DEVICE
BASE UNIT KHM-220AAA/J1N
R002 100
C004 0.1u B
R003 100
R022 150
R023 820
C010 0.1u B
R026 0
C029 0.1u B
C031 10u 16V
C017 5600p B
C019 5600p B
C018 560p
C005 2200p B
C007 2200p B
C008 2200p B
C009 2200p B
C011 22p
C013 22p
C014 22p
C015 22p
IC001 SSI33P3722
IC001
DVD/CD RF AMP, DIGITAL SERVO
RFIP
RFIN
CP
CN
A2
B2
C2
D2
D
C
B
A
E
F
G
H
ATOP
ATON
AIN
AIP
VPA
SSOUT
CLM
ENV
RX
BYP
SIGO
VNA
DIN
DIP
FNP
FNN
HOLD1
SIGDET
SDEN
SRD
SWD
SCLK
HOLD2
BYP2
FE
TE
TEI2
TEI
TEO
TZIN
VP3
VCI
VC
VPB
PD
LD
VNB
MP
MB
MLPF
LDON
MIRR
FOCHG
MIN
PI
TPH
DFT
TZC
R014 0
C035 0.1u B
R017 4700
C040 6800p B
R015 10k
R016 10k
R018 10k
C036 0.047u B
C037 560p
C038 0.1u B
C039 0.1u B
R029 2.2M
C023 0.047u
C025 0.047u
C027 150p
C030 0.1u B
C032 0.1u B
C020 0.1u B
R005 33
R006 33
R007 47k
C012 10u 16V
R008 10
Q001 2SB1132-T100-QR LD DRIVE
D003 1SS355TE-17
L001 47uH
C006 10u 16V
C016 0.01u B
R004 22k
R025 220
R010 10k
C041 2200p B
R012 0
Q002 UN5211-TX INVERTER
MIRR
PI
SSDFCTI
SSDFCT
TZC
CN002 13P
LED
INLIM
GND
SLB-(4)
SLA+(2)
SLB+(3)
SLA-(1)
SPM+
SPM-
TIB-(4)
TIB+(3)
TIA-(1)
TIA+(2)
R001 330
C001 0.1u
C002 0.1u
INLIMIT SENSOR
SLED MOTOR
SPINDLE MOTOR
TILT MOTOR
CN007 2P
OCSW2
GND
S001 CHUCK SENSOR
CN006 2P
LDM+
LDM-
M001 LOADING MOTOR
CN003 18P
5V
GND
MIRR
SSDFCTI
TZC
2VC
PI
TE
FE
3.3V
SSCK
SSWD
SSRD
SSCS
SSDFCT
RF-
RF+
GND
MB-85 BOARD CN002 (SEE PAGE 4-23)
CN004 18P
GND
RF MON
GND
TRK-
TRK+
FCS-
FCS+
INLIM
SLB-
SLA+
SLB+
SLA-
SPM+
SPM-
TIB-
TIB+
TIA-
TIA+
MB-85 BOARD CN003 (SEE PAGE 4-25)
CN005 6P
OCSW2
GND
OCSW1
CKSW1
LDM+
LDM-
MB-85 BOARD CN011 (SEE PAGE 4-26)
C044 0.1u
C045 0.1u
05

NO MARK:DVD/CD PLAY

SIGNAL PATH

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
PB	⇨⇨	⇨

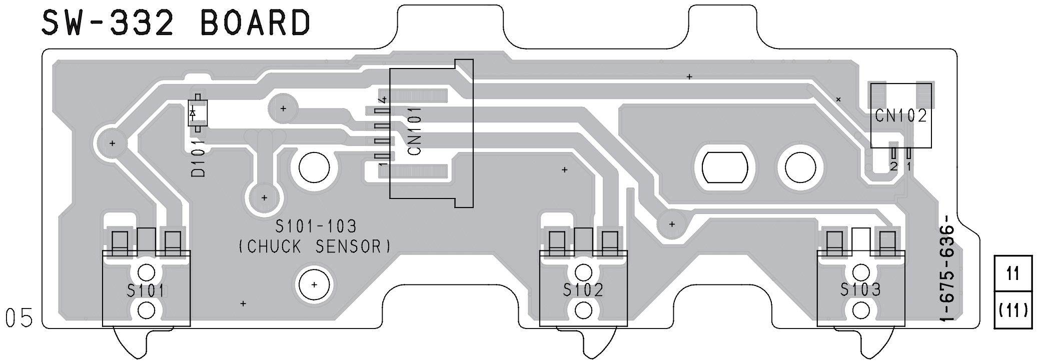
SPINDLE SERVO(SPEED AND PHASE)	➤≫
TRACKING SERVO DVD/CD CDV	➤
SLED SERVO DVD/CD	▷
FOCUS SERVO	➤
SKEW SERVO DVD/CD	▷

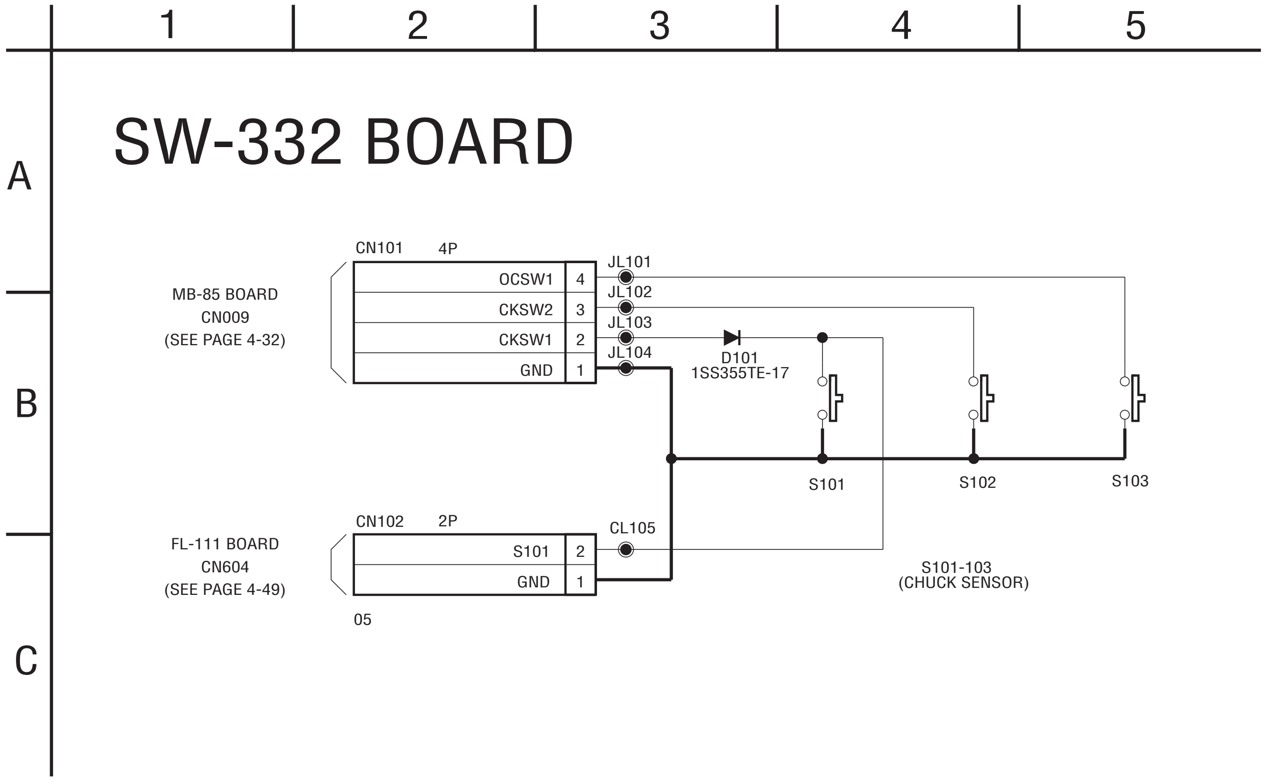
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

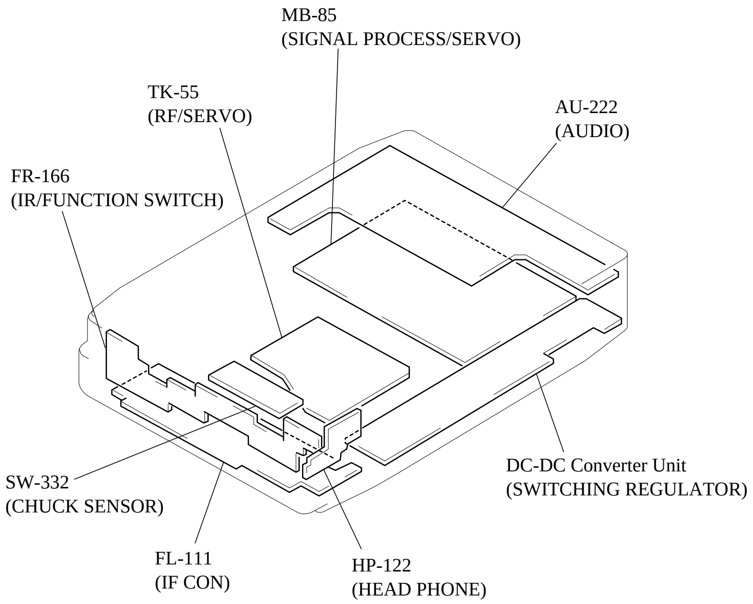
SW-332 (CHUCK SENSOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: SW-332 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.


SW-332 BOARD
D101
CN101
CN102
S101-103
(CHUCK SENSOR)
S101
S102
S103
05
1-675-636-
11
(11)


1
2
3
4
5
A
B
C
SW-332 BOARD
MB-85 BOARD
CN009
(SEE PAGE 4-32)
CN101 4P
OCSW1 4
CKSW2 3
CKSW1 2
GND 1
JL101
JL102
JL103
JL104
D101
1SS355TE-17
S101
S102
S103
FL-111 BOARD
CN604
(SEE PAGE 4-49)
CN102 2P
S101 2
GND 1
CL105
S101-103
(CHUCK SENSOR)
05


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

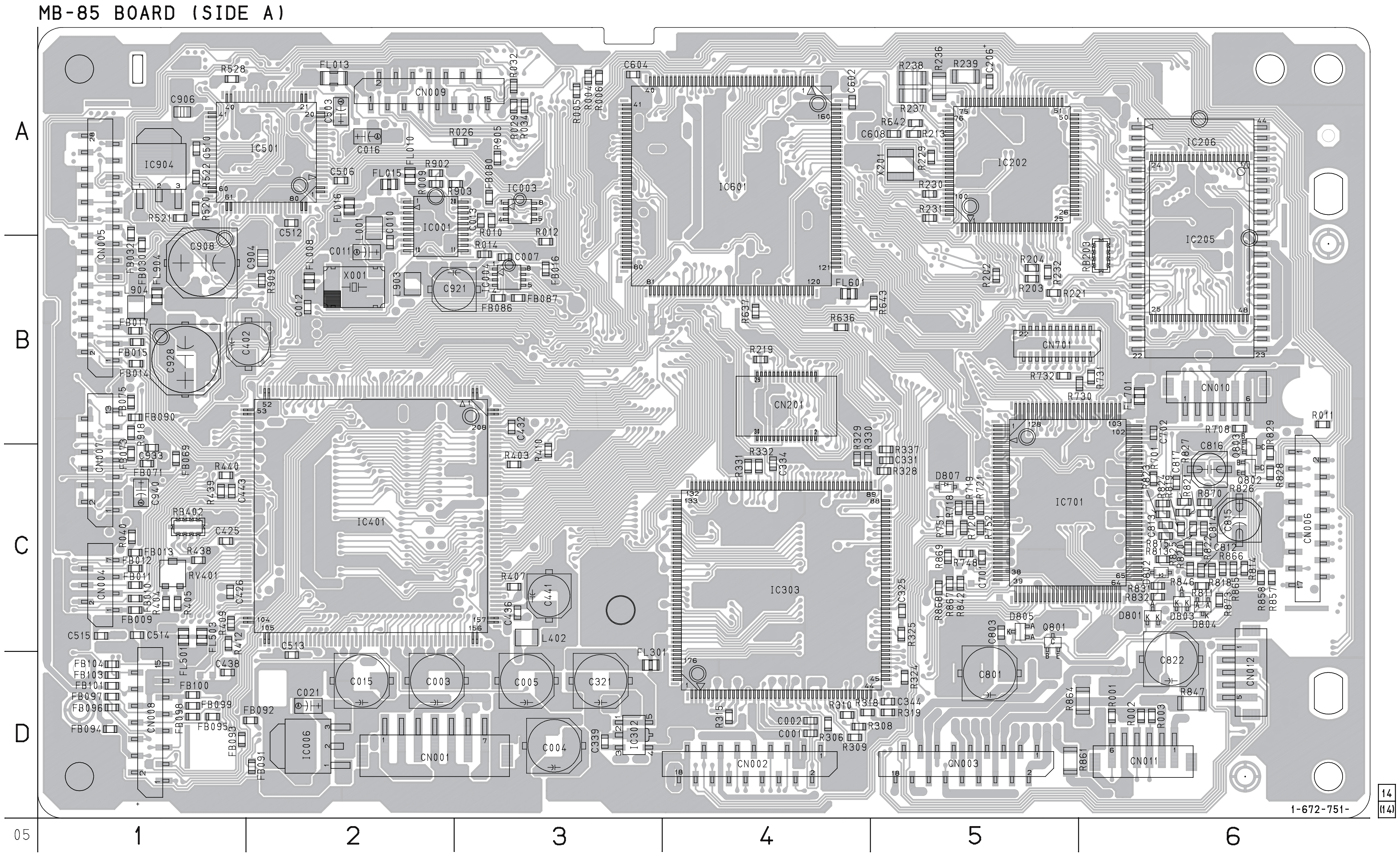
MB-85 (SIGNAL PROCESS/SERVO) PRINTED WIRING BOARD

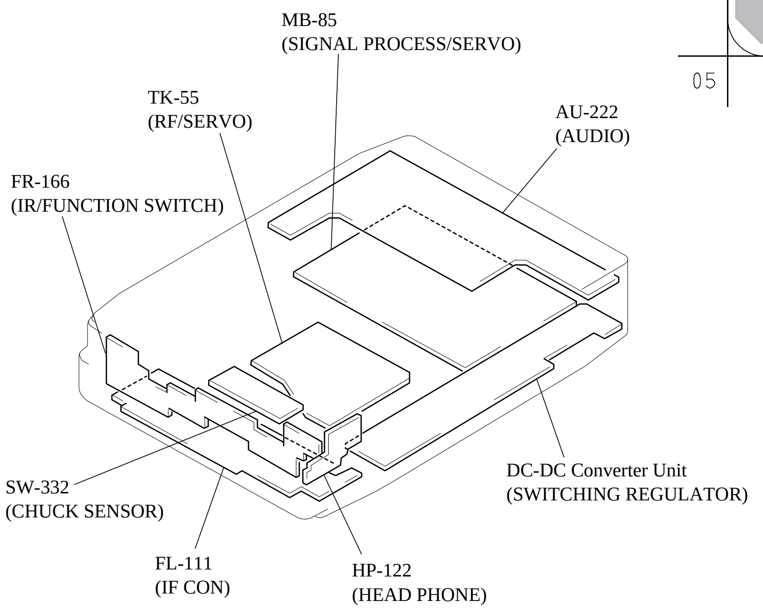
– Ref. No.: MB-85 board; 1,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

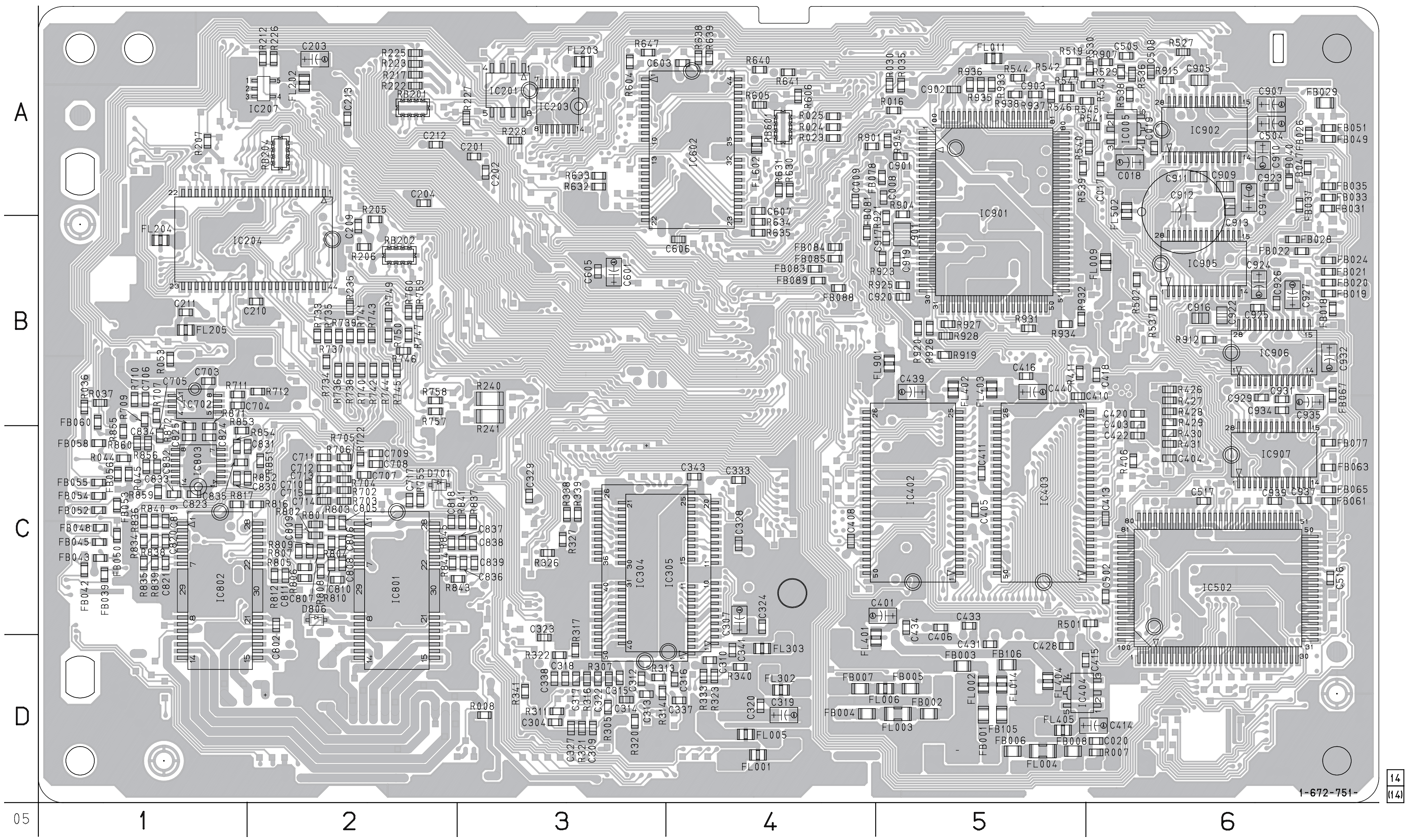
MB-85 BOARD (SIDE A)

CN001	D-2
CN002	D-4
CN003	D-5
CN005	B-1
CN006	C-7
CN007	C-1
CN009	A-2
CN010	B-6
CN011	D-6
CN012	D-6
D801	C-6
D802	C-6
D803	C-6
D804	C-6
D805	C-5
D807	C-5
IC001	A-2
IC003	A-3
IC004	B-3
IC202	A-5
IC205	B-6
IC206	B-6
IC302	D-3
IC303	C-4
IC401	C-2
IC501	A-2
IC601	A-4
IC701	C-5
IC904	A-1
Q801	C-5
Q802	C-6
Q803	C-6


MB-85 BOARD (SIDE A)
A
B
C
D
1
2
3
4
5
6
05
IC904
IC501
IC001
IC003
IC601
IC202
IC206
IC205
IC401
IC303
IC701
IC006
IC302
CN001
CN002
CN003
CN004
CN005
CN006
CN007
CN008
CN009
CN010
CN011
CN012
CN201
CN701
X001
X201
C908
C928
C402
C921
C441
C015
C003
C005
C321
C004
C801
C822
C815
L402
1-672-751-
14
(14)


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

MB-85 BOARD (SIDE B)

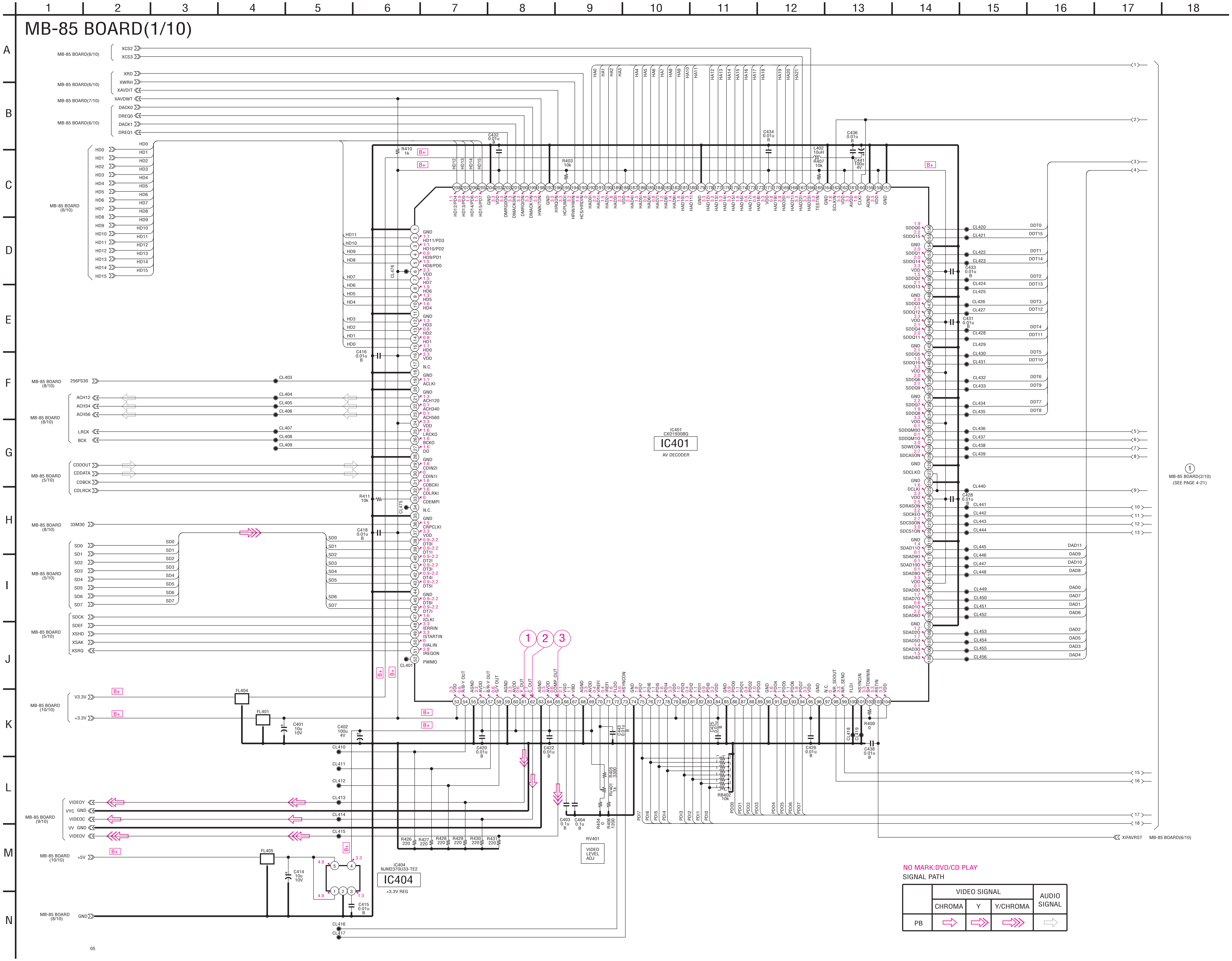

A
B
C
D
1
2
3
4
5
6
05
1-672-751-
14
(14)

MB-85 BOARD (SIDE B)

D701	C-2
D806	C-2
IC005	A-6
IC201	A-3
IC203	A-3
IC204	B-2
IC207	A-2
IC304	C-3
IC402	C-5
IC403	C-5
IC404	D-5
IC702	B-1
IC801	C-2
IC802	C-1
IC803	C-1
IC902	A-6
IC907	C-6

MB-85 (AV DECODER) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
I
J
K
L
M
N
MB-85 BOARD(1/10)
MB-85 BOARD(6/10)
XCS2
XCS3
XRD
XWRH
XAVDIT
MB-85 BOARD(7/10)
XAVDWT
DACK0
DREQ0
DACK1
DREQ1
MB-85 BOARD (6/10)
HD0
HD1
HD2
HD3
HD4
HD5
HD6
HD7
HD8
HD9
HD10
HD11
HD12
HD13
HD14
HD15
MB-85 BOARD (8/10)
256FS30
ACH12
ACH34
ACH56
LRCK
BCK
MB-85 BOARD (5/10)
CDDOUT
CDDATA
CDBCK
CDLRCK
33M30
SD0
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SDCK
SDEF
XSHD
XSAK
XSRQ
MB-85 BOARD (10/10)
V3.3V
+3.3V
MB-85 BOARD (9/10)
VIDEOY
VYC GND
VIDEOC
VV GND
VIDEOV
+5V
GND
FL401
FL404
FL405
C401 10u 10V
C402 100u 4V
C414 10u 10V
C415 0.01u B
C416 0.01u B
C418 0.01u B
C420 0.01u B
C422 0.01u B
C426 0.01u B
C428 0.01u B
C431 0.01u B
C432 0.01u B
C433 0.01u B
C434 0.01u B
C436 0.01u B
C438 0.01u B
C441 100u 4V
C403 0.1u B
C404 0.1u B
L402 10uH
R403 10k
R407 10k
R409 0
R410 1k
R411 10k
R426 220
R427 220
R428 220
R429 220
R430 220
R431 220
RB402 10k
RV401 VIDEO LEVEL ADJ
IC401 CXD1930BQ
IC401
AV DECODER
IC404 NJM2370U33-TE2
IC404
+3.3V REG
B+
DDT0
DDT15
DDT1
DDT14
DDT2
DDT13
DDT3
DDT12
DDT4
DDT11
DDT5
DDT10
DDT6
DDT9
DDT7
DDT8
DAD11
DAD9
DAD10
DAD8
DAD0
DAD7
DAD1
DAD6
DAD2
DAD5
DAD3
DAD4
PD00
PD01
PD02
PD03
PD04
PD05
PD06
PD07
PDI0
PDI1
PDI2
PDI3
PDI4
PDI5
PDI6
PDI7
XIFAVRST
MB-85 BOARD(6/10)
MB-85 BOARD(2/10) (SEE PAGE 4-21)
05

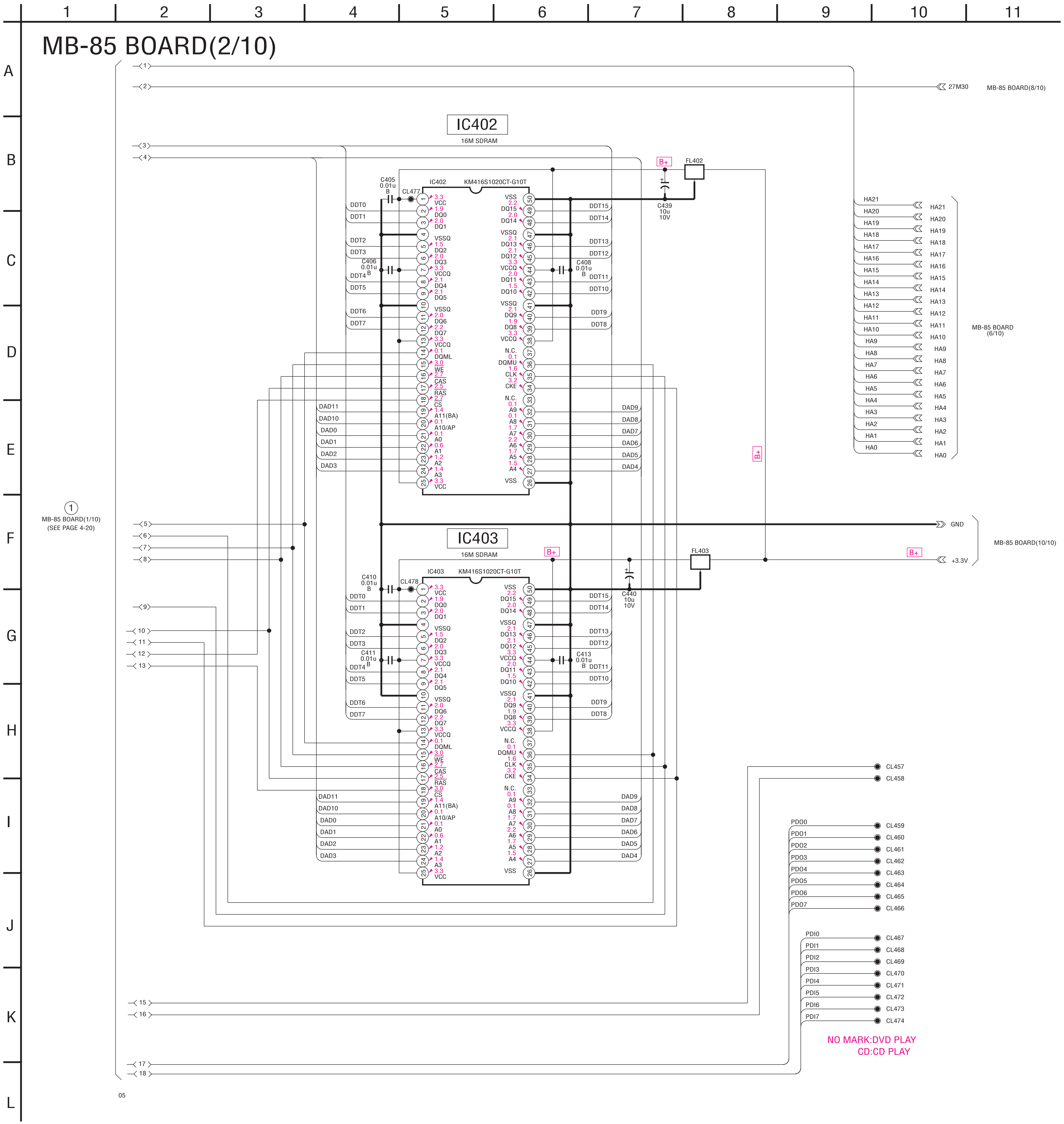
NO MARK:DVD/CD PLAY

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨⇨	⇨⇨⇨	⇨

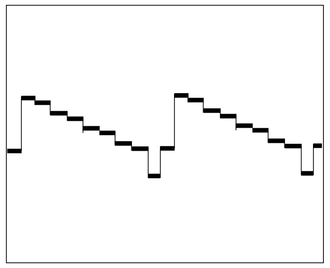
MB-85 (SDRAM) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


MB-85 BOARD(2/10)
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
K
L
IC402
16M SDRAM
IC402 KM416S1020CT-G10T
IC403
16M SDRAM
IC403 KM416S1020CT-G10T
C405 0.01u B
CL477
C406 0.01u B
C408 0.01u B
C439 10u 10V
C410 0.01u B
CL478
C411 0.01u B
C413 0.01u B
C440 10u 10V
FL402
FL403
B+
27M30
MB-85 BOARD(8/10)
MB-85 BOARD (6/10)
GND
+3.3V
MB-85 BOARD(10/10)
①
MB-85 BOARD(1/10) (SEE PAGE 4-20)
DDT0
DDT1
DDT2
DDT3
DDT4
DDT5
DDT6
DDT7
DDT8
DDT9
DDT10
DDT11
DDT12
DDT13
DDT14
DDT15
DAD0
DAD1
DAD2
DAD3
DAD4
DAD5
DAD6
DAD7
DAD8
DAD9
DAD10
DAD11
VCC
VSS
VSSQ
VCCQ
DQ0
DQ15
DQML
DQMU
WE
CAS
RAS
CS
CLK
CKE
N.C.
A11(BA)
A10/AP
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
HA0
HA1
HA2
HA3
HA4
HA5
HA6
HA7
HA8
HA9
HA10
HA11
HA12
HA13
HA14
HA15
HA16
HA17
HA18
HA19
HA20
HA21
PDO0
PDO1
PDO2
PDO3
PDO4
PDO5
PDO6
PDO7
PDI0
PDI1
PDI2
PDI3
PDI4
PDI5
PDI6
PDI7
CL457
CL458
CL459
CL460
CL461
CL462
CL463
CL464
CL465
CL466
CL467
CL468
CL469
CL470
CL471
CL472
CL473
CL474
NO MARK:DVD PLAY
CD:CD PLAY
05

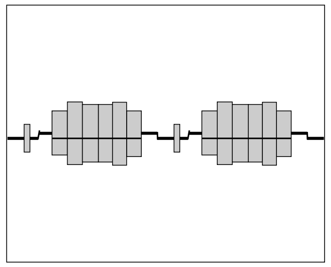
• Waveforms

❶ IC401 (61)



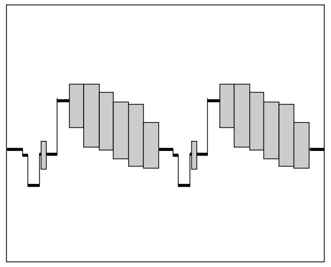
1.1 Vp-p (H)

❷ IC401 (62)



816 mVp-p (H)

❸ IC401 (65)



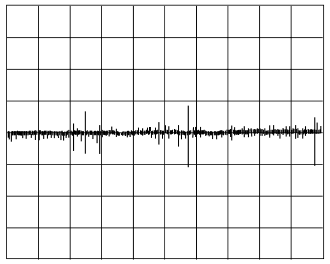
1.2 Vp-p (H)

MB-85 (SERVO DSP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –

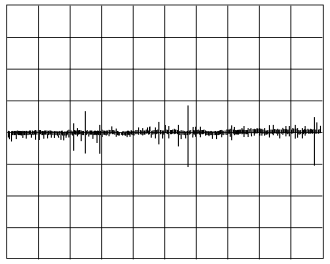
- **Waveforms**

❶ IC701 ⑲ (DVD play)
500 mV/DIV 50 ms/DIV



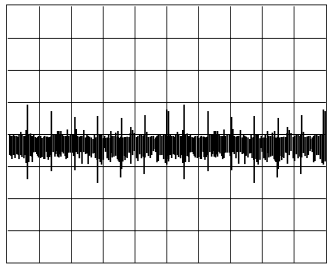
1.4 Vp-p

❷ IC701 ⑲ (CD play)
500 mV/DIV 200 mV/DIV



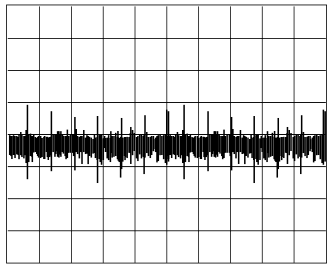
1.7 Vp-p

❸ IC701 ⑱ (DVD play)
100 mV/DIV 5 ms/DIV

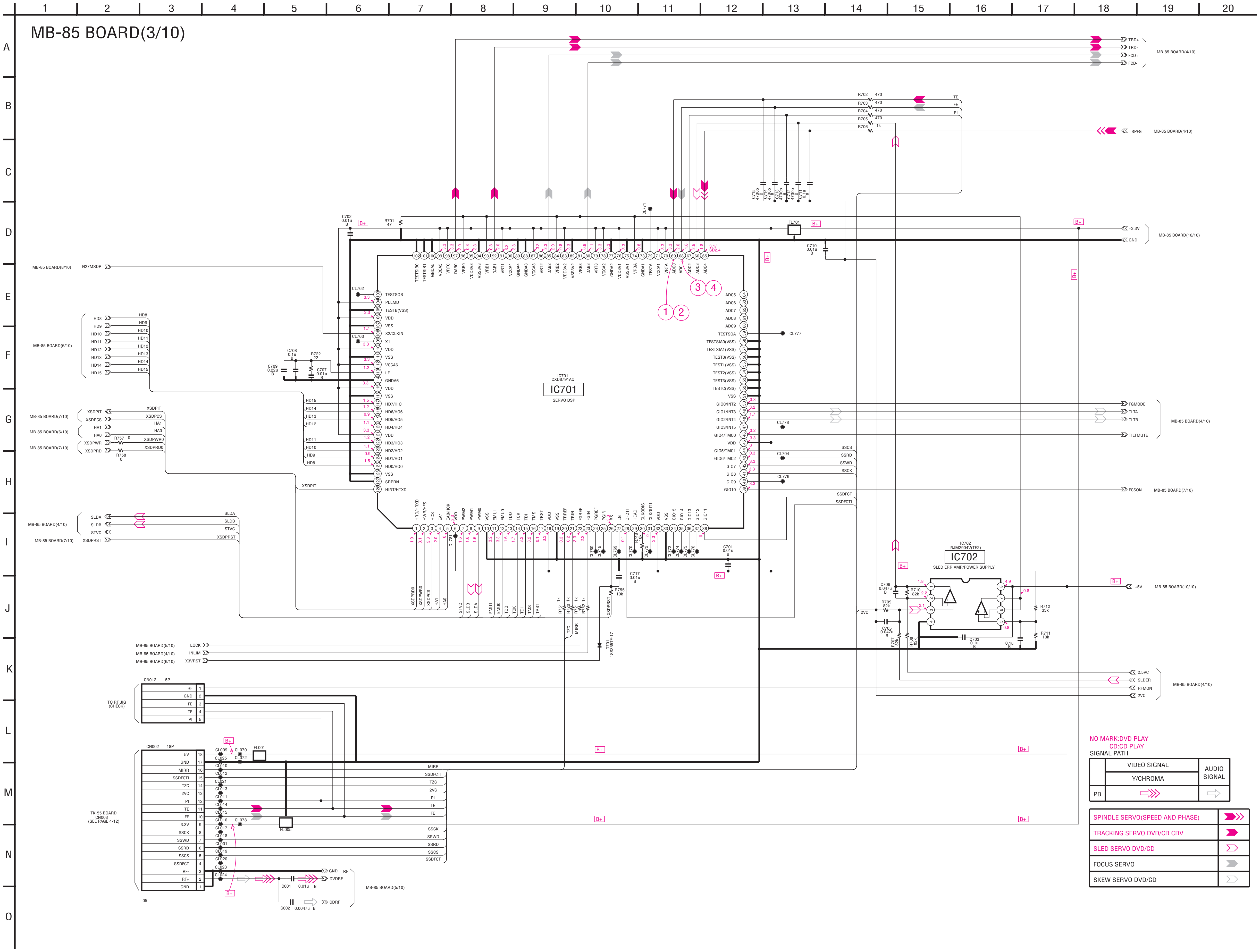


180 mVp-p

❹ IC701 ⑱ (CD play)
500 mV/DIV 50 ms/DIV



860 mVp-p


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N O
MB-85 BOARD(3/10)
IC701
CXD8791AQ
SERVO DSP
IC702
NJM2904V(TE2)
SLED ERR AMP/POWER SUPPLY
TRD+
TRD-
FCD+
FCD-
MB-85 BOARD(4/10)
SPFG
+3.3V
GND
MB-85 BOARD(10/10)
FGMODE
TLTA
TLTB
TILTMUTE
FCSON
MB-85 BOARD(7/10)
+5V
2.5VC
SLDER
RFMON
2VC
MB-85 BOARD(8/10)
N27MSDP
MB-85 BOARD(6/10)
HD8
HD9
HD10
HD11
HD12
HD13
HD14
HD15
XSDPIT
XSDPCS
HA1
HA0
XSDPWR
XSDPRD
SLDA
SLDB
STVC
XSDPRST
MB-85 BOARD(5/10)
LOCK
INLIM
X3VRST
CN012 5P
TO RF JIG (CHECK)
RF
GND
FE
TE
PI
CN002 18P
TK-55 BOARD CN003 (SEE PAGE 4-12)
5V
GND
MIRR
SSDFCTI
TZC
2VC
PI
TE
FE
3.3V
SSCK
SSWD
SSRD
SSCS
SSDFCT
RF-
RF+
GND
DVDRF
CDRF
FL001
FL002
FL701
B+

NO MARK:DVD PLAY
CD:CD PLAY

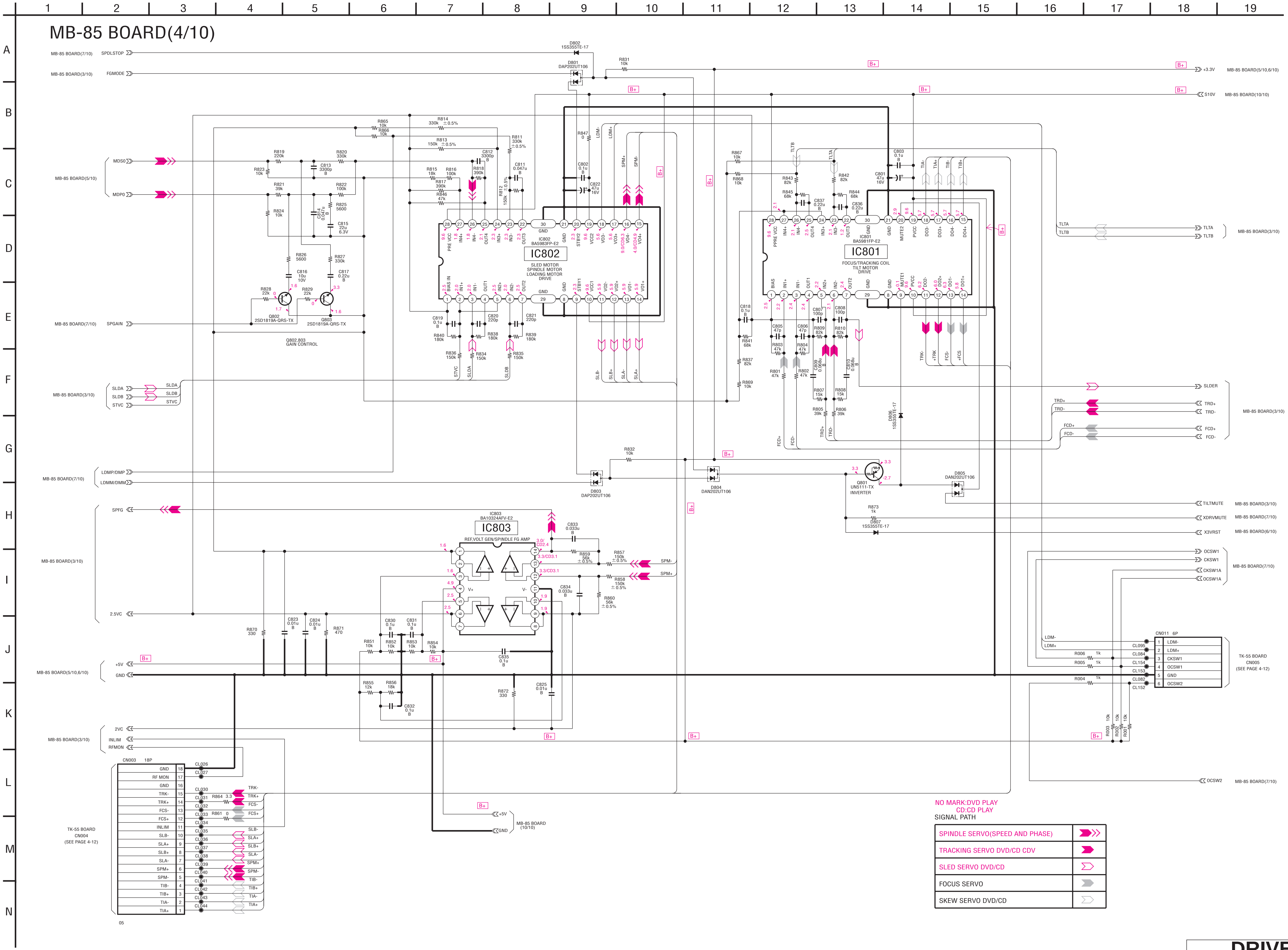
SIGNAL PATH

	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
PB	⇨	⇨

SPINDLE SERVO(SPEED AND PHASE)	⋙
TRACKING SERVO DVD/CD CDV	➤
SLED SERVO DVD/CD	▷
FOCUS SERVO	➤
SKEW SERVO DVD/CD	▷

MB-85 (DRIVE) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –

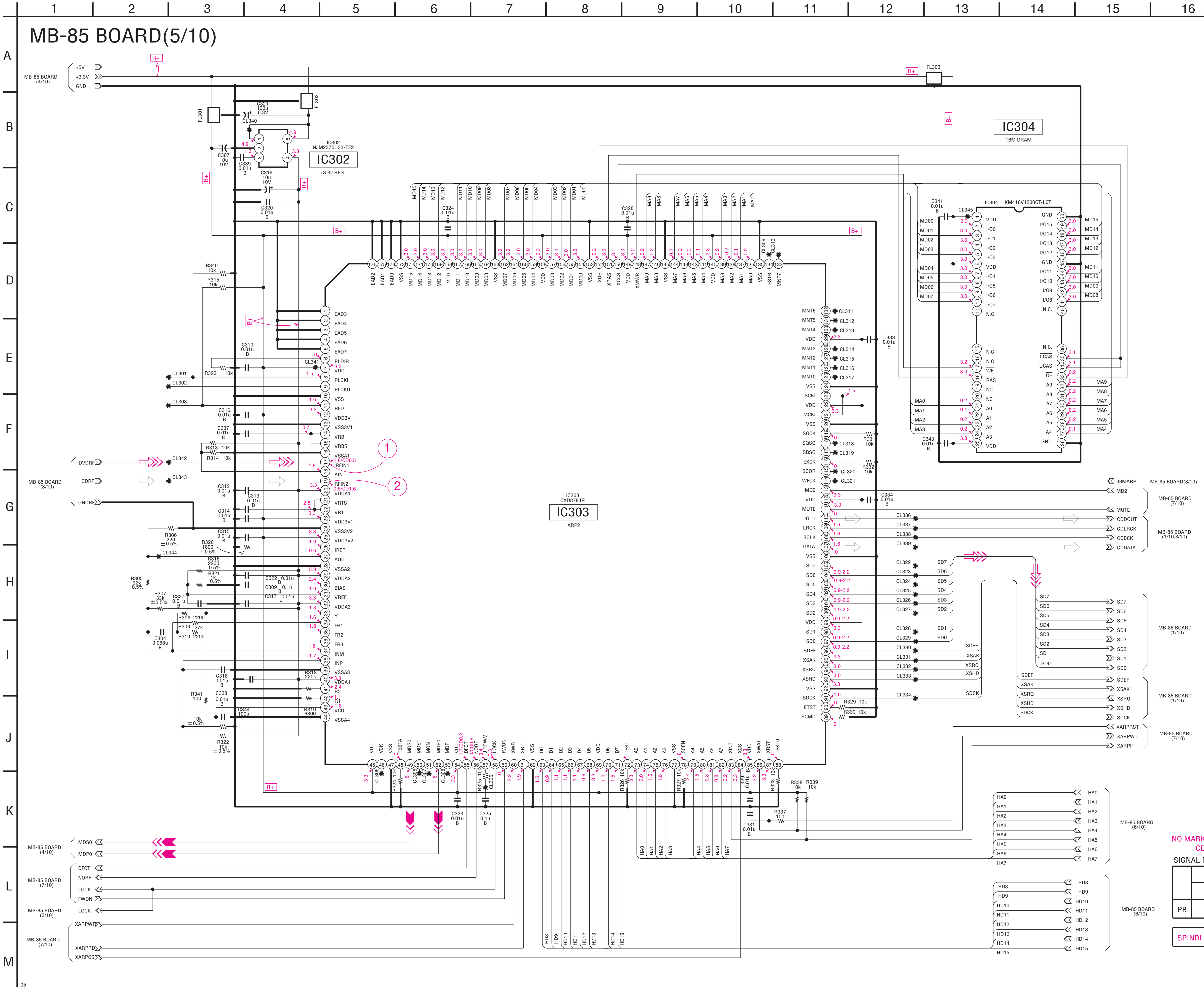

MB-85 BOARD(4/10)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
K
L
M
N
MB-85 BOARD(7/10) SPDLSTOP
MB-85 BOARD(3/10) FGMODE
MB-85 BOARD(5/10) MDS0 MDP0
MB-85 BOARD(7/10) SPGAIN
MB-85 BOARD(3/10) SLDA SLDB STVC
MB-85 BOARD(7/10) LDMP/DMP LDMM/DMM
SPFG
MB-85 BOARD(3/10) 2.5VC
MB-85 BOARD(5/10,6/10) +5V GND
MB-85 BOARD(3/10) 2VC INLIM RFMON
D802 1SS355TE-17
D801 DAP202UT106
R831 10k
+3.3V MB-85 BOARD(5/10,6/10)
S10V MB-85 BOARD(10/10)
Q802 2SD1819A-QRS-TX
Q803 2SD1819A-QRS-TX
Q802,803 GAIN CONTROL
IC802 BA5983FP-E2
IC802
SLED MOTOR SPINDLE MOTOR LOADING MOTOR DRIVE
IC801 BA5981FP-E2
IC801
FOCUS/TRACKING COIL TILT MOTOR DRIVE
TLTA TLTB MB-85 BOARD(3/10)
SLDER TRD+ TRD- FCD+ FCD- MB-85 BOARD(3/10)
D803 DAP202UT106
D804 DAN202UT106
Q801 UN5111-TX INVERTER
D805 DAN202UT106
D806 1SS355TE-17
D807 1SS355TE-17
R873 1k
TILTMUTE MB-85 BOARD(3/10)
XDRVMUTE MB-85 BOARD(7/10)
X3VRST MB-85 BOARD(6/10)
IC803 BA10324AFV-E2
IC803
REF.VOLT GEN/SPINDLE FG AMP
SPM- SPM+
OCSW1 CKSW1 CKSW1A OCSW1A MB-85 BOARD(7/10)
CN011 6P
1 LDM-
2 LDM+
3 CKSW1
4 OCSW1
5 GND
6 OCSW2
TK-55 BOARD CN005 (SEE PAGE 4-12)
OCSW2 MB-85 BOARD(7/10)
CN003 18P
18 GND
17 RF MON
16 GND
15 TRK-
14 TRK+
13 FCS-
12 FCS+
11 INLIM
10 SLB-
9 SLA+
8 SLB+
7 SLA-
6 SPM+
5 SPM-
4 TIB-
3 TIB+
2 TIA-
1 TIA+
TK-55 BOARD CN004 (SEE PAGE 4-12)
+5V GND MB-85 BOARD (10/10)
05

NO MARK:DVD PLAY
CD:CD PLAY
SIGNAL PATH

SPINDLE SERVO(SPEED AND PHASE)	⏩
TRACKING SERVO DVD/CD CDV	➤
SLED SERVO DVD/CD	▷
FOCUS SERVO	➤
SKEW SERVO DVD/CD	▷

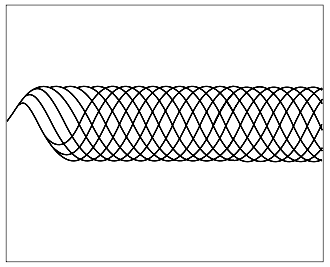
MB-85 (ARP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


MB-85 BOARD(5/10)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J K L M
MB-85 BOARD (4/10)
+5V
+3.3V
GND
FL301
FL302
FL303
C321 100u 6.3V
CL340
C307 10u 10V
C339 0.01u B
C319 10u 10V
C320 0.01u B
IC302
NJM2370U33-TE2
+3.3v REG
IC303
CXD8784R
ARP2
IC304
16M DRAM
IC304 KM416V1200CT-L6T
R340 10k
R315 10k
C310 0.01u B
R323 10k
CL301
CL302
CL303
CL341
C316 0.01u B
C337 0.01u B
R313 10k
R314 10k
MB-85 BOARD (3/10)
DVDRF
CDRF
GNDRF
CL342
CL343
C312 0.01u B
C313 0.01u B
C314 0.01u B
C315 0.01u B
R306 220 ±0.5%
R320 1800 ±0.5%
CL344
R316 2200 ±0.5%
R321 1k ±0.5%
R305 22k ±0.5%
R307 33k ±0.5%
C327 0.01u B
C322 0.01u B
C309 0.1u B
C317 0.01u B
R308 2200
R309 27k
R310 2200
C304 0.068u B
C318 0.01u B
R318 220k
R341 100
C338 0.01u B
C344 100p
R319 6800
10k ±0.5%
R322 10k ±0.5%
EAD3 EAD4 EAD5 EAD6 EAD7 PLDIR VDD PLCKI PLCKO VSS RFD VDD3V1 VSS3V1 VRB VRBS VSSA1 RFIN1 AIN RFIN2 VDDA1 VRTS VRT VDD3V1 VSS3V2 VDD3V2 IREF AOUT VSSA2 VDDA2 BIAS VREF VDDA3 Y FR1 FR2 FR3 INM INP VSSA3 VDDA4 R2 R1 VCO VSSA4
EAD2 EAD1 EAD0 VSS MD15 MD14 MD13 MD12 VDD MD11 MD10 MD09 MD08 VSS MD07 MD06 MD05 MD04 VDD MD03 MD02 MD01 MD00 VSS XOE XRAS XCAS VDD XMWR MA9 MA8 VSS MA7 MA6 MA5 MA4 VDD MA3 MA2 MA1 MA0 VSS ESTB MNT7
MNT6 MNT5 MNT4 VDD MNT3 MNT2 MNT1 MNT0 VSS SCKI VDD MCKI VSS SQCK SQSO SBSO EXCK SCOR WFCK MD2 VDD MUTE DOUT LRCK BCLK DATA VSS SD7 SD6 SD5 SD4 SD3 SD2 VDD SD1 SD0 SDEF XSAK XSRQ XSHD VSS SDCK ETST SCMD
VDD VCK VSS TESTA MDSO MDS1 MON MDPO MDP1 VDD DFCT NORF LOCK FWON XWR XRD VSS D0 D1 D2 D3 D4 D5 VDD D6 D7 TEST A0 A1 A2 A3 VSS A4 A5 A6 A7 XINT XCS VDD XMAT XRST TESTO
CL309 CL310
CL311 CL312 CL313 CL314 CL315 CL316 CL317 CL318 CL319 CL320 CL321
C324 0.01u B
C328 0.01u B
C333 0.01u B
C334 0.01u B
R331 10k
R332 10k
R329 10k
R330 10k
C341 0.01u B
CL345
C343 0.01u B
VDD I/O0 I/O1 I/O2 I/O3 VDD I/O4 I/O5 I/O6 I/O7 N.C. N.C. N.C. WE RAS NC NC A0 A1 A2 A3 VDD
GND I/O15 I/O14 I/O13 I/O12 GND I/O11 I/O10 I/O9 I/O8 N.C. N.C. LCAS UCAS OE A9 A8 A7 A6 A5 A4 GND
1.6 Vp-p
33MARP
MB-85 BOARD(8/10)
MD2
MUTE
MB-85 BOARD (7/10)
CDDOUT
CDLRCK
CDBCK
CDDATA
MB-85 BOARD (1/10,8/10)
CL336 CL337 CL338 CL339
CL322 CL323 CL324 CL325 CL326 CL327 CL328 CL329 CL330 CL331 CL332 CL333 CL334
SD7 SD6 SD5 SD4 SD3 SD2 SD1 SD0
MB-85 BOARD (1/10)
SDEF XSAK XSRQ XSHD SDCK
XARPRST XARPWT XARPIT
MB-85 BOARD (7/10)
R324 10k
CL305
CL306
CL307
CL308
R325 10k
CL335
C323 0.01u B
C325 0.1u B
R326 10k
R327 10k
C329 0.01u B
R328 10k
R338 10k
R339 10k
R337 100
C331 0.01u B
HA0 HA1 HA2 HA3 HA4 HA5 HA6 HA7
MB-85 BOARD (6/10)
HD8 HD9 HD10 HD11 HD12 HD13 HD14 HD15
MB-85 BOARD (6/10)
MB-85 BOARD (4/10)
MDS0
MDP0
MB-85 BOARD (7/10)
DFCT
NORF
LOCK
FWON
MB-85 BOARD (3/10)
LOCK
MB-85 BOARD (7/10)
XARPWR
XARPRD
XARPCS
B+
1
2
05

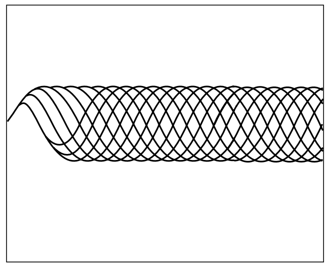
• Waveforms

❶ IC303 ⑰ (DVD play)
500 mV/DIV 100 ns/DIV



1.6 Vp-p

❷ IC303 ⑲ (CD play)
500 mV/DIV 200 ns/DIV



1.6 Vp-p

NO MARK:DVD PLAY
CD:CD PLAY

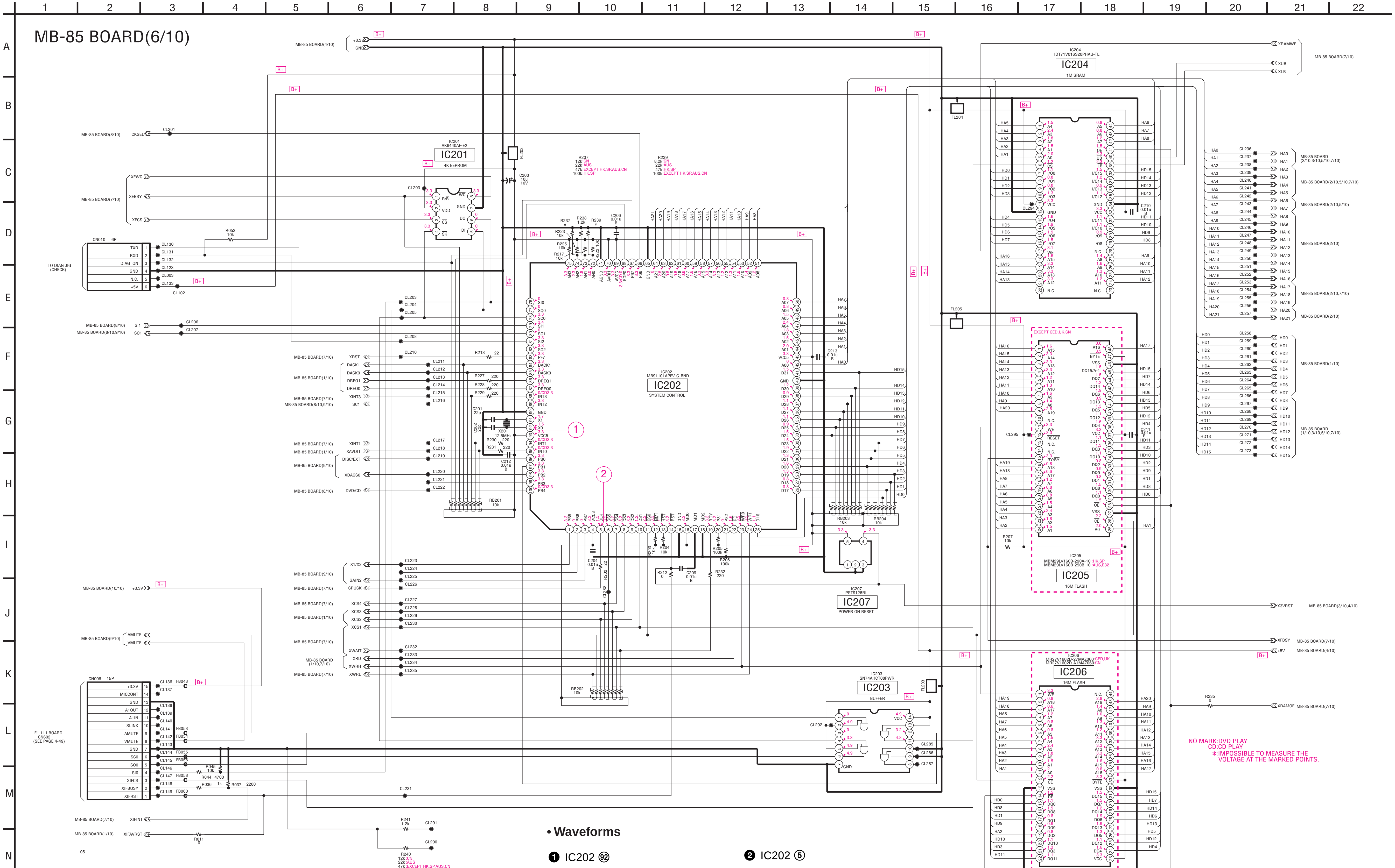
SIGNAL PATH

	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
PB	⇒	⇨

SPINDLE SERVO(SPEED AND PHASE)	⇛

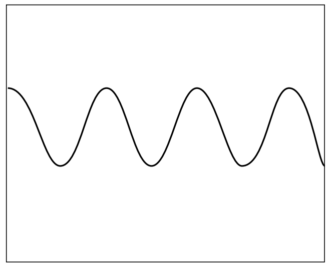
MB-85 (SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


MB-85 BOARD(6/10)
IC201 AK6440AF-E2 4K EEPROM
IC202 MB91101APFV-G-BND SYSTEM CONTROL
IC203 SN74AHCT08PWR BUFFER
IC204 IDT71V016S20PHAU-TL 1M SRAM
IC205 MBM29LV160B-90PFTN:HK,SP MBM29LV160B-90PFTN:AUS,E32 16M FLASH
IC206 MR27V1602D-27MAZ060:CED,UK MR27V1602D-A1MAZ060:CN 16M FLASH
IC207 PST9126NL POWER ON RESET
X201 12.5MHz
CN010 6P
TO DIAG JIG (CHECK)
CN006 15P
FL-111 BOARD CN602 (SEE PAGE 4-49)
EXCEPT CED,UK,CN
CED,UK,CN
NO MARK:DVD PLAY
CD:CD PLAY
∗:IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.
①
②

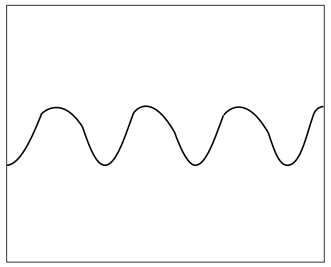
• Waveforms

❶ IC202 (92)



2.4 Vp-p (12.5 MHz)

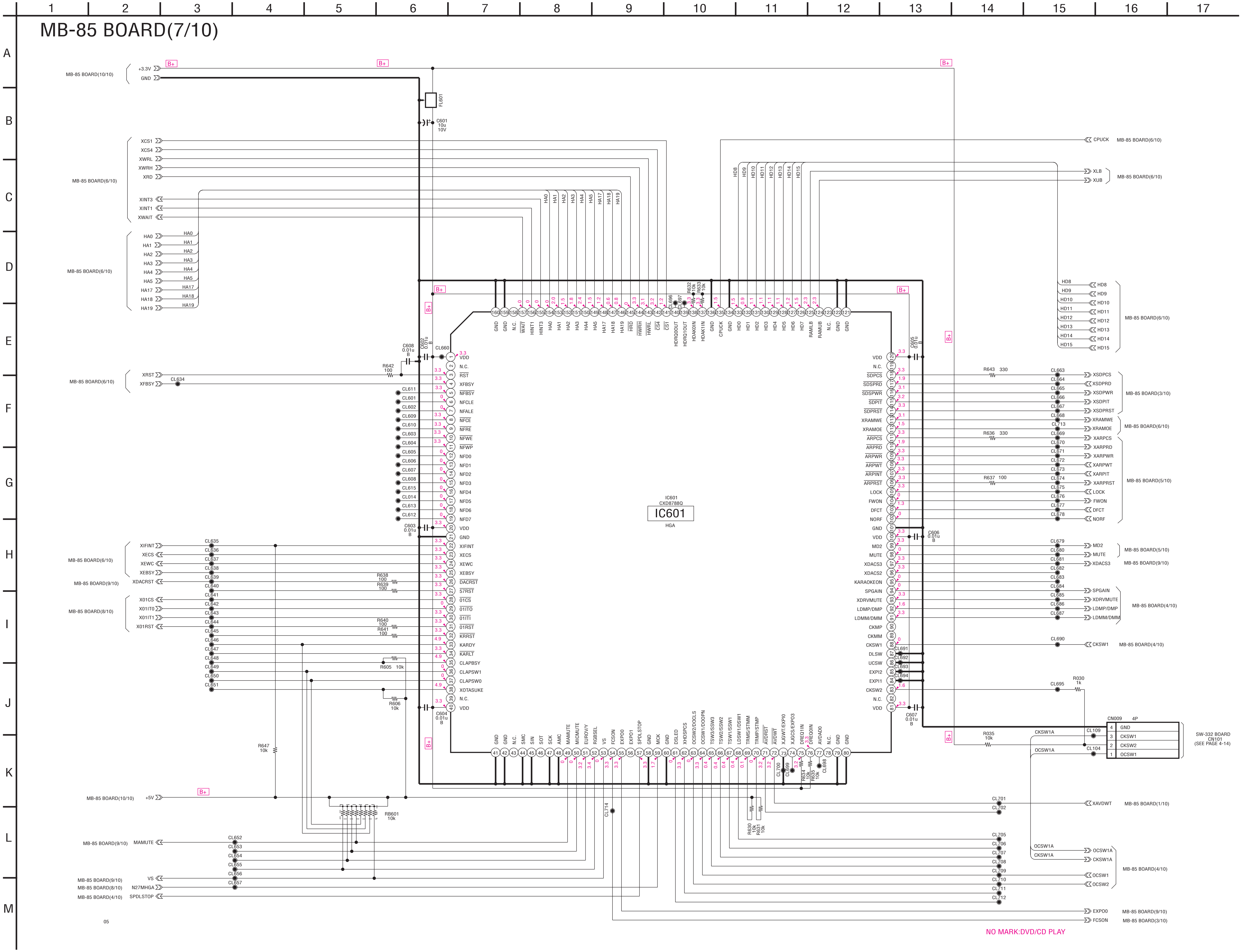
❷ IC202 ⑤



4 Vp-p (25.3 MHz)

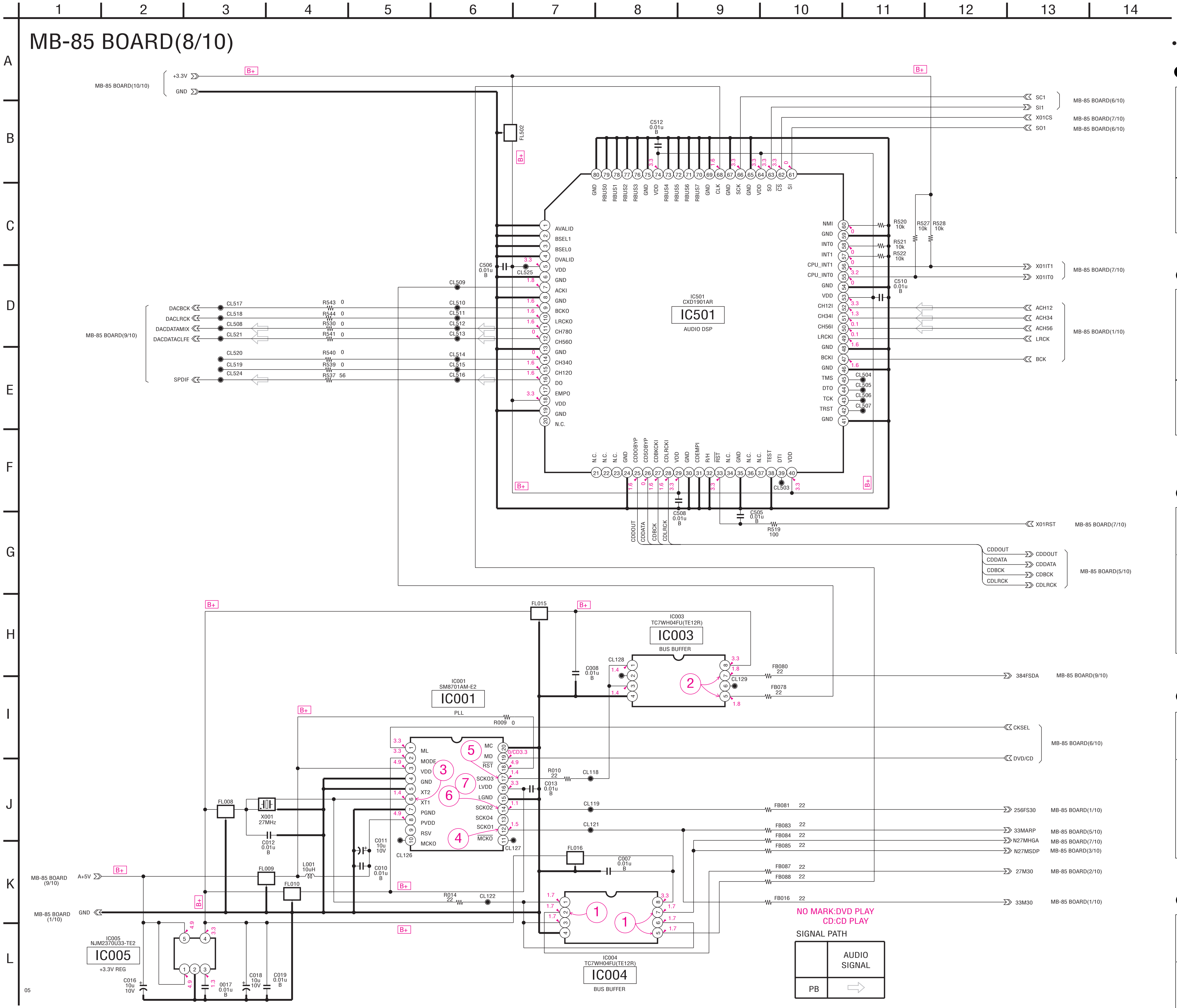
MB-85 (HGA) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


MB-85 BOARD(7/10)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
A B C D E F G H I J K L M
MB-85 BOARD(10/10)
+3.3V
GND
B+
FL601
C601 10u 10V
MB-85 BOARD(6/10)
XCS1
XCS4
XWRL
XWRH
XRD
XINT3
XINT1
XWAIT
HA0
HA1
HA2
HA3
HA4
HA5
HA17
HA18
HA19
CPUCK
XLB
XUB
HD8
HD9
HD10
HD11
HD12
HD13
HD14
HD15
XRST
XFBSY
CL634
R642 100
C608 0.01u B
C602 0.01u B
CL660
VDD
N.C.
RST
XFBSY
NFBSY
NFCLE
NFALE
NFCE
NFRE
NFWE
NFWP
NFD0
NFD1
NFD2
NFD3
NFD4
NFD5
NFD6
NFD7
GND
XIFINT
XECS
XEWC
XEBSY
DACRST
57RST
01CS
01IT0
01IT1
01RST
KRRST
KARDY
KARLT
CLAPBSY
CLAPSW1
CLAPSW0
XOTASUKE
IC601 CXD8788Q
IC601
HGA
SDPCS
SDSPRD
SDSPWR
SDPIT
SDPRST
XRAMWE
XRAMOE
ARPCS
ARPRD
ARPWR
ARPWT
ARPINT
ARPRST
LOCK
FWON
DFCT
NORF
MD2
MUTE
XDACS3
XDACS2
KARAOKEON
SPGAIN
XDRVMUTE
LDMP/DMP
LDMM/DMM
CKMP
CKMM
CKSW1
DLSW
UCSW
EXPI2
EXPI1
CKSW2
R643 330
R636 330
R637 100
XSDPCS
XSDPRD
XSDPWR
XSDPIT
XSDPRST
MB-85 BOARD(3/10)
XARPCS
XARPRD
XARPWR
XARPWT
XARPIT
XARPRST
MB-85 BOARD(5/10)
MB-85 BOARD(9/10)
MB-85 BOARD(4/10)
MB-85 BOARD(8/10)
XIFINT
XECS
XEWC
XEBSY
XDACRST
X01CS
X01IT0
X01IT1
X01RST
R638 100
R639 100
R640 100
R641 100
R605 10k
R606 10k
R647 10k
C603 0.01u B
C604 0.01u B
C605 0.01u B
C606 0.01u B
C607 0.01u B
R030 1k
R035 10k
CN009 4P
GND
CKSW1
CKSW2
OCSW1
CKSW1A
OCSW1A
SW-332 BOARD CN101 (SEE PAGE 4-14)
+5V
RB601 10k
MAMUTE
VS
N27MHGA
SPDLSTOP
XAVDWT
OCSW1A
CKSW1A
OCSW1
OCSW2
EXPO0
FCSON
NO MARK:DVD/CD PLAY
05

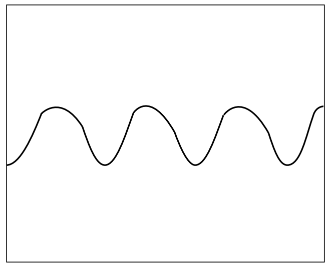
MB-85 (CLOCK GENERATOR/AUDIO DSP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


MB-85 BOARD(8/10)
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I J K L
IC501
CXD1901AR
AUDIO DSP
IC001
SM8701AM-E2
PLL
IC003
TC7WH04FU(TE12R)
BUS BUFFER
IC004
TC7WH04FU(TE12R)
BUS BUFFER
IC005
NJM2370U33-TE2
+3.3V REG
X001
27MHz
MB-85 BOARD(10/10)
+3.3V
GND
MB-85 BOARD(6/10)
MB-85 BOARD(7/10)
MB-85 BOARD(9/10)
MB-85 BOARD(1/10)
MB-85 BOARD(5/10)
MB-85 BOARD(2/10)
MB-85 BOARD(3/10)
A+5V
DACBCK
DACLRCK
DACDATAMIX
DACDATACLFE
SPDIF
SCI
SII
X01CS
SOI
X01IT1
X01IT0
ACH12
ACH34
ACH56
LRCK
BCK
X01RST
CDDOUT
CDDATA
CDBCK
CDLRCK
384FSDA
CKSEL
DVD/CD
256FS30
33MARP
N27MHGA
N27MSDP
27M30
33M30
NO MARK:DVD PLAY
CD:CD PLAY
SIGNAL PATH
AUDIO
SIGNAL
PB
05

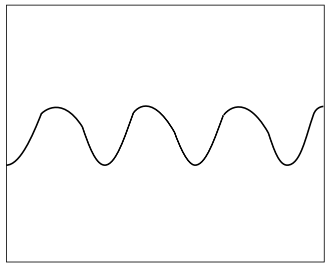
• Waveforms

❶ IC004 ②, ⑤, ⑦



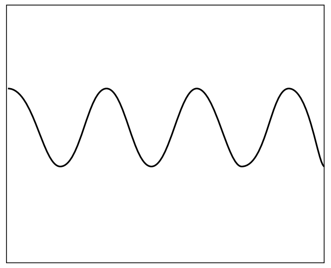
4.2 Vp-p (26.9 MHz)

❷ IC004 ⑤, ⑦



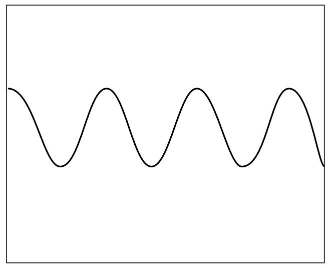
DVD: 6.2 Vp-p (37.0 MHz)
CD : 5 Vp-p (33.6 MHz)

❸ IC001 ⑥



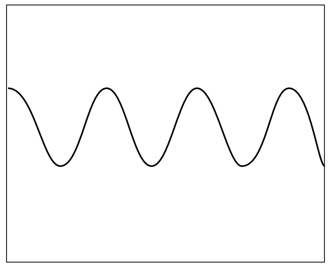
4.2 Vp-p (27.0 MHz)

❹ IC001 ⑫



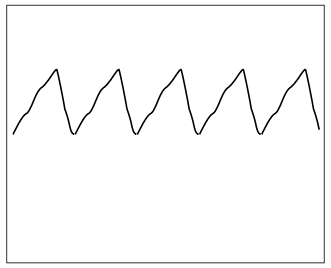
4.6 Vp-p (33.8 MHz)

❺ IC001 ⑰



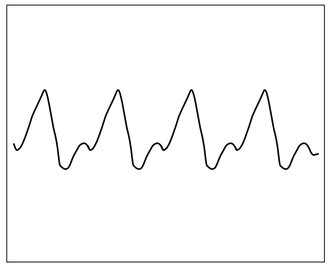
DVD: 5.8 Vp-p (36.5 MHz)
CD : 5.1 Vp-p (33.8 MHz)

❻ IC001 ⑭ (DVD play)



4.2 Vp-p (25.3 MHz)

❼ IC001 ⑭ (CD play)

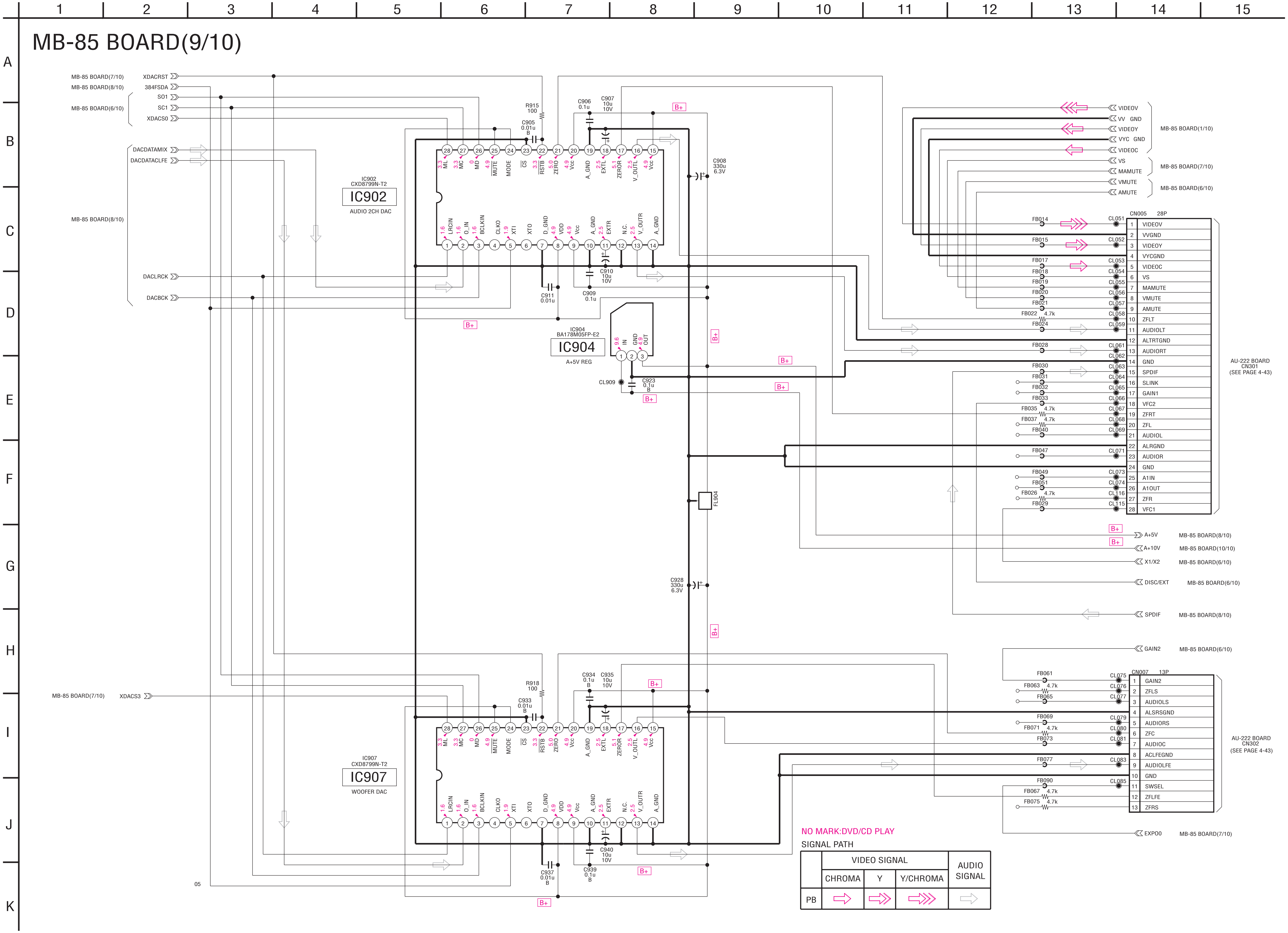


4.7 Vp-p (22.5 MHz)

CLOCK GENERATOR/AUDIO DSP
MB-85 (8/10)

MB-85 (DAC) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
MB-85 BOARD(9/10)
MB-85 BOARD(7/10) XDACRST
MB-85 BOARD(8/10) 384FSDA
SO1
MB-85 BOARD(6/10) SC1
XDACS0
DACDATAMIX
DACDATACLFE
MB-85 BOARD(8/10)
DACLRCK
DACBCK
IC902
CXD8799N-T2
IC902
AUDIO 2CH DAC
ML
MC
MD
MUTE
MODE
CS
RSTB
ZERO
Vcc
A_GND
EXTL
ZEROR
V_OUTL
LRCIN
D_IN
BCLKIN
CLKO
XTI
XTO
D_GND
VDD
EXTR
N.C.
V_OUTR
R915
100
C905
0.01u
B
C906
0.1u
C907
10u
10V
C908
330u
6.3V
C909
0.1u
C910
10u
10V
C911
0.01u
B+
IC904
BA178M05FP-E2
IC904
A+5V REG
IN
GND
OUT
CL909
C923
0.1u
B
FL904
C928
330u
6.3V
MB-85 BOARD(7/10) XDACS3
R918
100
C933
0.01u
B
C934
0.1u
B
C935
10u
10V
IC907
CXD8799N-T2
IC907
WOOFER DAC
C937
0.01u
B
C939
0.1u
B
C940
10u
10V
05
VIDEOV
VV GND
VIDEOY
VYC GND
VIDEOC
MB-85 BOARD(1/10)
VS
MAMUTE
MB-85 BOARD(7/10)
VMUTE
AMUTE
MB-85 BOARD(6/10)
CN005 28P
1 VIDEOV
2 VVGND
3 VIDEOY
4 VYCGND
5 VIDEOC
6 VS
7 MAMUTE
8 VMUTE
9 AMUTE
10 ZFLT
11 AUDIOLT
12 ALTRTGND
13 AUDIORT
14 GND
15 SPDIF
16 SLINK
17 GAIN1
18 VFC2
19 ZFRT
20 ZFL
21 AUDIOL
22 ALRGND
23 AUDIOR
24 GND
25 A1IN
26 A1OUT
27 ZFR
28 VFC1
AU-222 BOARD
CN301
(SEE PAGE 4-43)
A+5V MB-85 BOARD(8/10)
A+10V MB-85 BOARD(10/10)
X1/X2 MB-85 BOARD(6/10)
DISC/EXT MB-85 BOARD(6/10)
SPDIF MB-85 BOARD(8/10)
GAIN2 MB-85 BOARD(6/10)
CN007 13P
1 GAIN2
2 ZFLS
3 AUDIOLS
4 ALSRSGND
5 AUDIORS
6 ZFC
7 AUDIOC
8 ACLFEGND
9 AUDIOLFE
10 GND
11 SWSEL
12 ZFLFE
13 ZFRS
AU-222 BOARD
CN302
(SEE PAGE 4-43)
EXPO0 MB-85 BOARD(7/10)

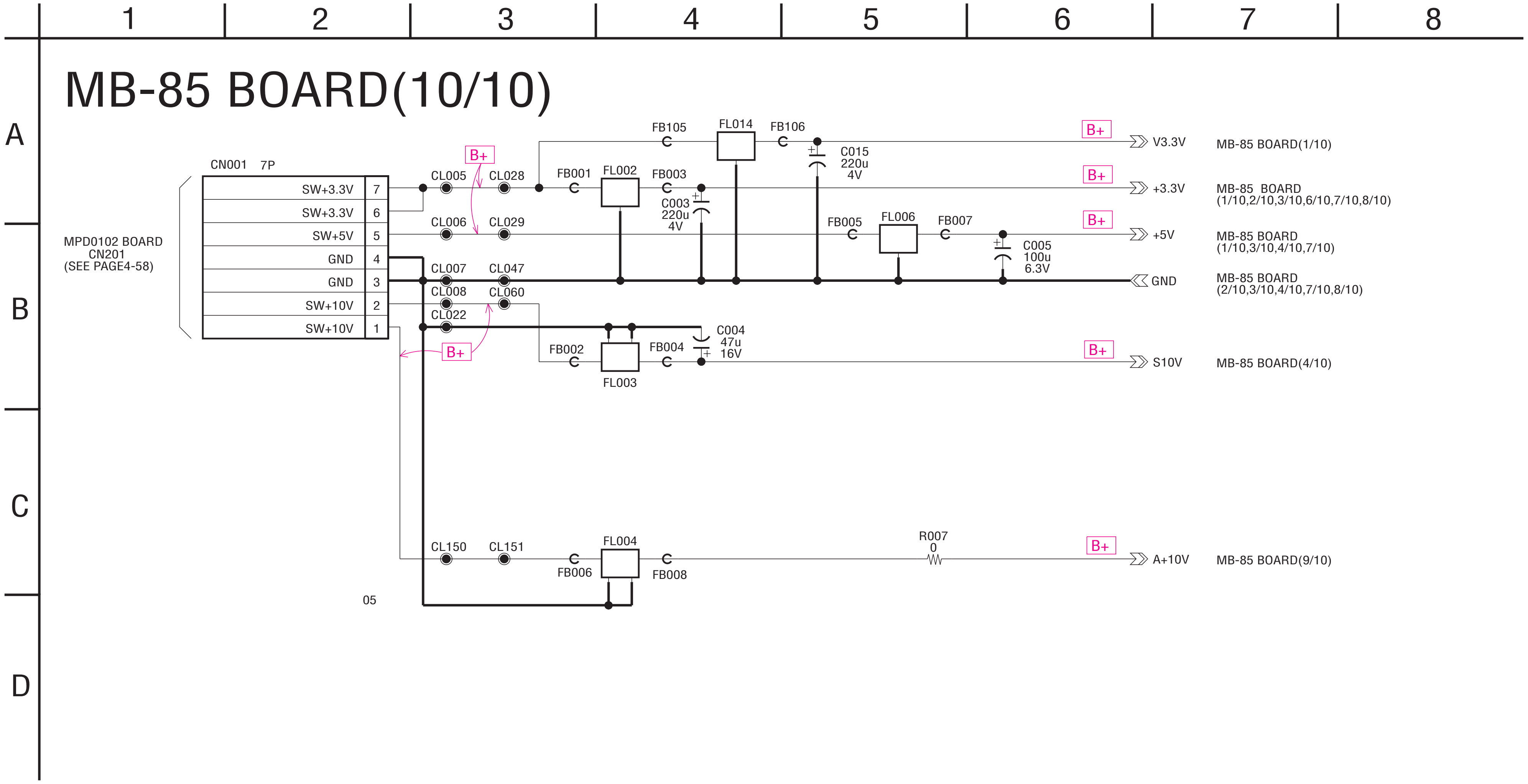
NO MARK:DVD/CD PLAY

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨	⇨	⇨

MB-85 (BIAS) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-85 board; 1,000 series –


1
2
3
4
5
6
7
8
A
B
C
D
MB-85 BOARD(10/10)
CN001 7P
SW+3.3V 7
SW+3.3V 6
SW+5V 5
GND 4
GND 3
SW+10V 2
SW+10V 1
MPD0102 BOARD
CN201
(SEE PAGE4-58)
CL005
CL028
CL006
CL029
CL007
CL047
CL008
CL060
CL022
CL150
CL151
B+
FB105
FL014
FB106
C015
220u
4V
FB001
FL002
FB003
C003
220u
4V
FB005
FL006
FB007
C005
100u
6.3V
FB002
FL003
FB004
C004
47u
16V
FB006
FL004
FB008
R007
0
05
V3.3V
+3.3V
+5V
GND
S10V
A+10V
MB-85 BOARD(1/10)
MB-85 BOARD
(1/10,2/10,3/10,6/10,7/10,8/10)
MB-85 BOARD
(1/10,3/10,4/10,7/10)
MB-85 BOARD
(2/10,3/10,4/10,7/10,8/10)
MB-85 BOARD(4/10)
MB-85 BOARD(9/10)

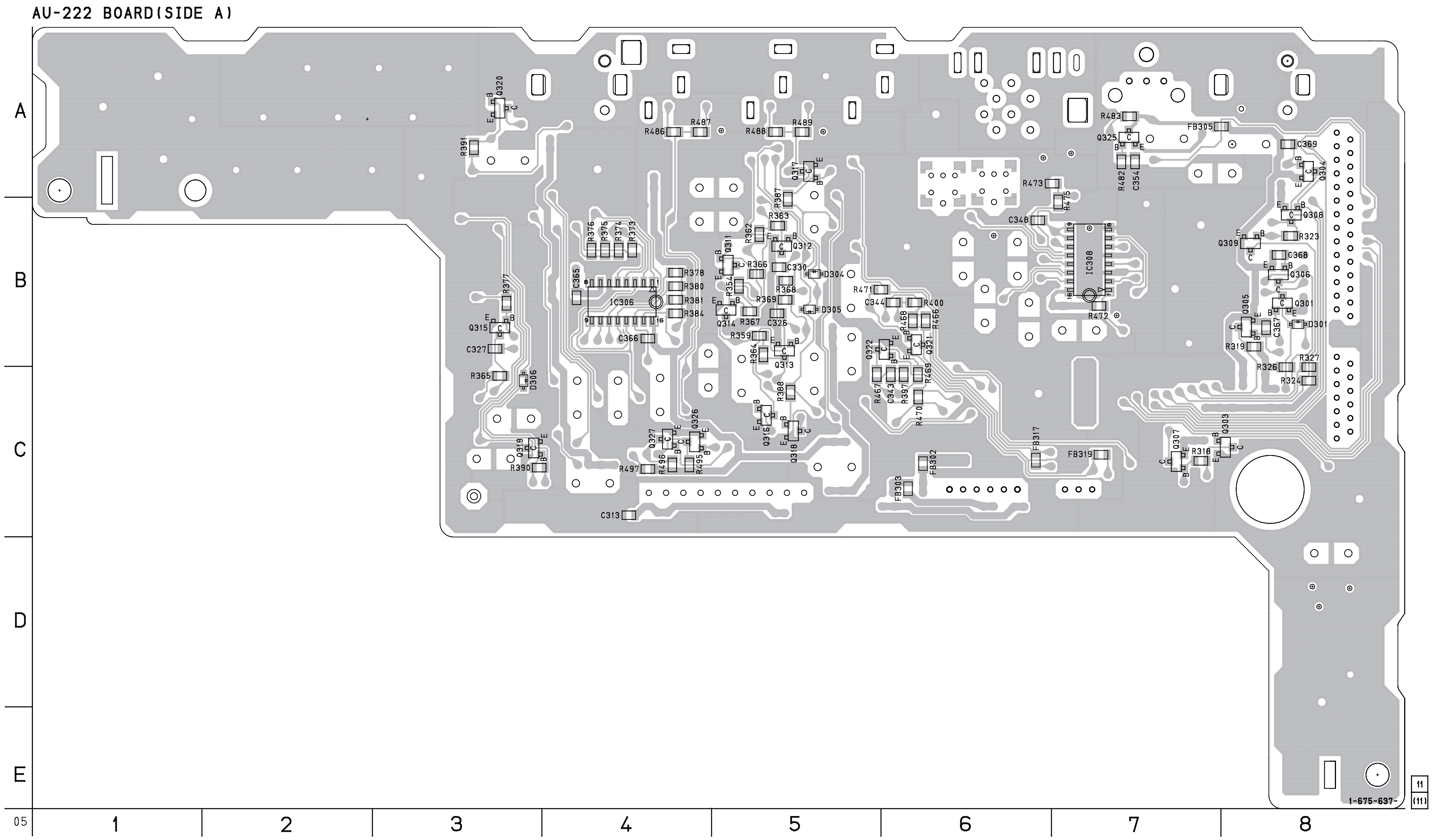
AU-222 (AUDIO/VIDEO BUFFER) PRINTED WIRING BOARD

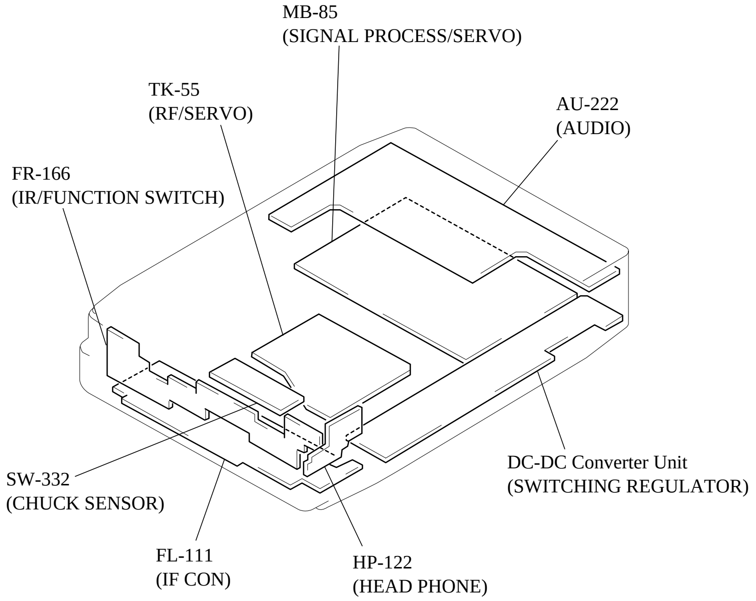
– Ref. No.: AU-222 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

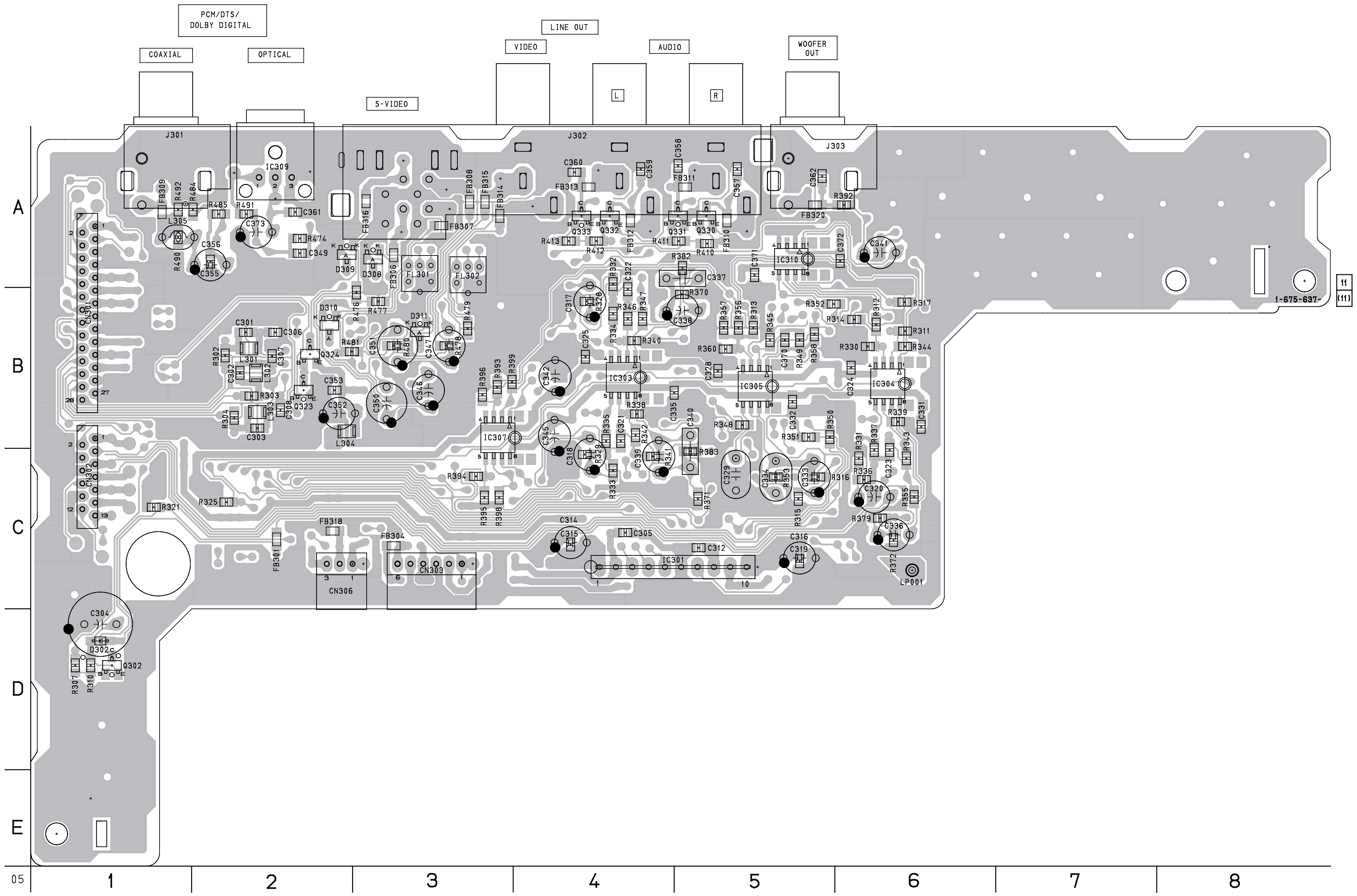
AU-222 BOARD (SIDE A)

D301	B-8
D304	B-5
D305	B-5
D306	C-3
IC306	B-4
IC308	B-7
Q301	B-8
Q303	C-8
Q304	A-8
Q305	B-8
Q306	B-8
Q307	C-7
Q311	B-5
Q314	B-5
Q317	A-5
Q318	C-5
Q319	C-3
Q320	A-3
Q321	B-6
Q322	B-5
Q325	A-7
Q326	C-4
Q327	C-4


AU-222 BOARD(SIDE A)
A
B
C
D
E
05
1
2
3
4
5
6
7
8
IC306
IC308
1-675-637-
11
(11)


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

AU-222 BOARD(SIDE B)


PCM/DTS/
DOLBY DIGITAL
COAXIAL
OPTICAL
S-VIDEO
LINE OUT
VIDEO
AUDIO
L
R
WOOFER
OUT
J301
IC309
J302
J303
CN301
CN302
CN306
CN303
IC301
IC303
IC304
IC305
IC307
IC310
C304
D302
Q302
LP001
1-675-637-
11
(11)
A
B
C
D
E
05
1
2
3
4
5
6
7
8

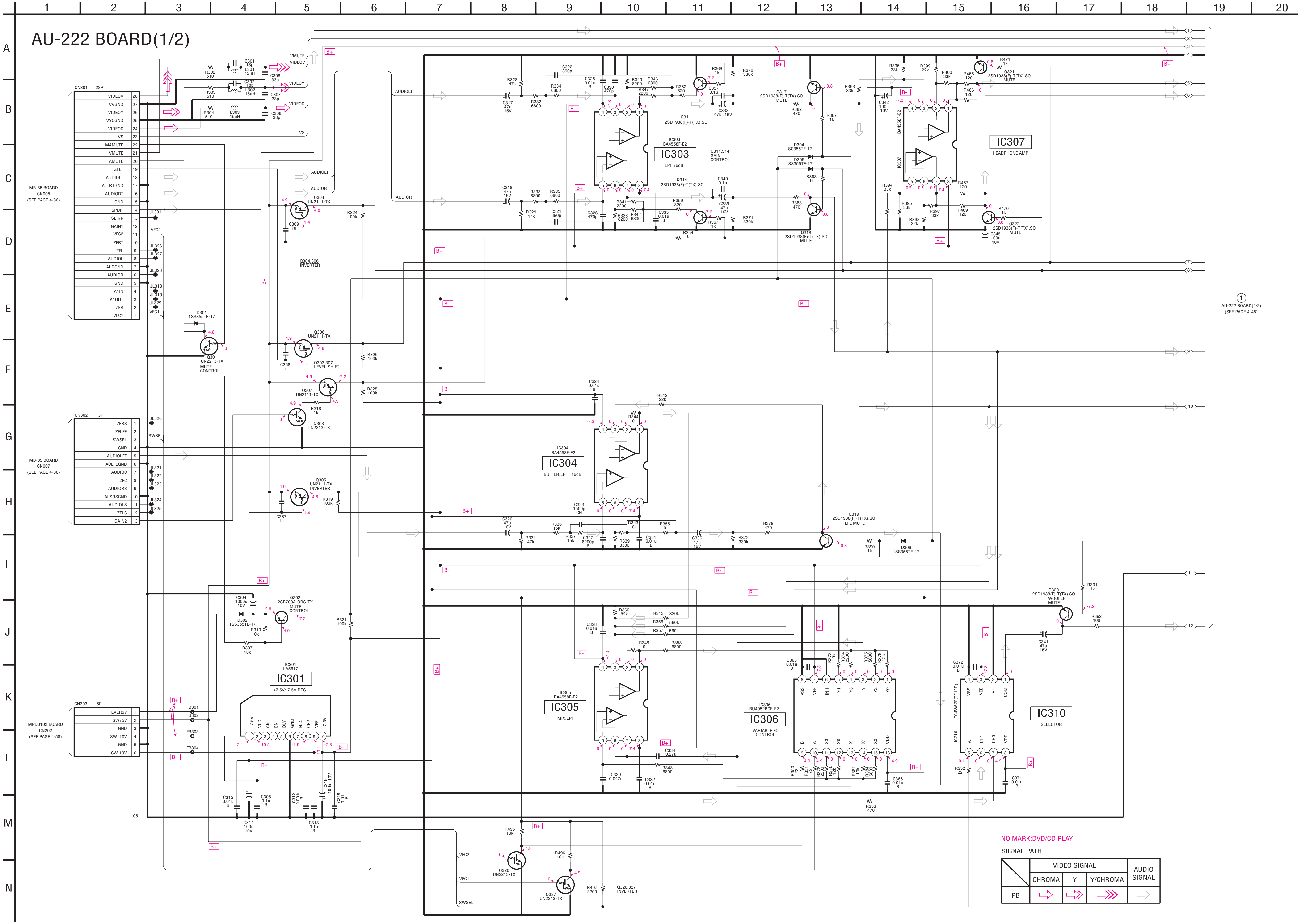
AU-222 BOARD (SIDE B)

CN301	B-1
CN302	C-1
CN303	C-3
CN306	C-2
D302	D-1
D308	A-3
D309	A-2
D310	B-2
D311	B-3
IC301	C-4
IC303	B-4
IC304	B-6
IC305	B-5
IC307	B-3
IC309	A-2
IC310	A-5
Q302	D-1
Q323	B-2
Q324	B-2
Q330	A-5
Q331	A-5
Q332	A-4
Q333	A-4

AUDIO/VIDEO BUFFER
AU-222

AU-222 (AUDIO) SCHEMATIC DIAGRAM • See page 4-39 for printed wiring board.

– Ref. No.: AU-222 board; 2,000 series –


AU-222 BOARD(1/2)
1
2
3
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7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
K
L
M
N
CN301 28P
MB-85 BOARD CN005 (SEE PAGE 4-36)
CN302 13P
MB-85 BOARD CN007 (SEE PAGE 4-36)
CN303 6P
MPD0102 BOARD CN202 (SEE PAGE 4-58)
IC301 LA5617
IC301
+7.5V/-7.5V REG
IC303 BA4558F-E2
IC303
LPF +6dB
Q311,314 GAIN CONTROL
IC304 BA4558F-E2
IC304
BUFFER,LPF +16dB
IC305 BA4558F-E2
IC305
MIX,LPF
IC306 BU4052BCF-E2
IC306
VARIABLE FC CONTROL
IC307
HEADPHONE AMP
IC310
SELECTOR
Q301 UN2213-TX MUTE CONTROL
Q302 2SB709A-QRS-TX MUTE CONTROL
Q304,306 INVERTER
Q303,307 LEVEL SHIFT
Q305 UN2111-TX INVERTER
Q317 2SD1938(F)-T(TX).SO MUTE
Q318 2SD1938(F)-T(TX).SO MUTE
Q319 2SD1938(F)-T(TX).SO LFE MUTE
Q320 2SD1938(F)-T(TX).SO WOOFER MUTE
Q321 2SD1938(F)-T(TX).SO MUTE
Q322 2SD1938(F)-T(TX).SO MUTE
Q326,327 INVERTER
AU-222 BOARD(2/2) (SEE PAGE 4-45)
05

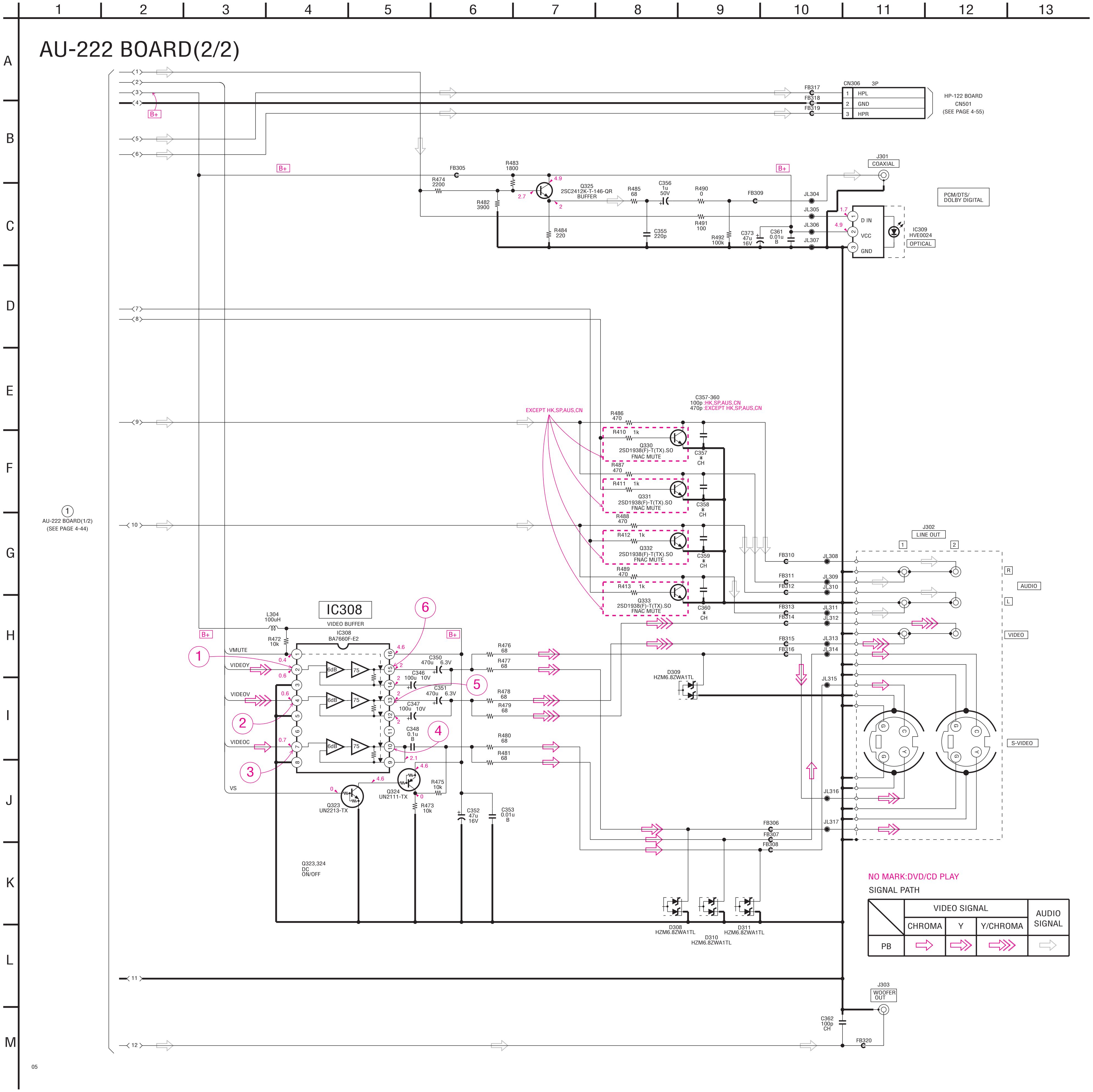
NO MARK:DVD/CD PLAY

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨	⇨	⇨

AU-222 (VIDEO BUFFER) SCHEMATIC DIAGRAM • See page 4-39 for printed wiring board.

– Ref. No.: AU-222 board; 2,000 series –


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
K
L
M
AU-222 BOARD(2/2)
① AU-222 BOARD(1/2) (SEE PAGE 4-44)
B+
CN306 3P
1 HPL
2 GND
3 HPR
HP-122 BOARD CN501 (SEE PAGE 4-55)
FB317
FB318
FB319
J301 COAXIAL
PCM/DTS/ DOLBY DIGITAL
FB305
R483 1800
R474 2200
Q325 2SC2412K-T-146-QR BUFFER
R482 3900
R484 220
R485 68
C356 1u 50V
R490 0
FB309
R491 100
C355 220p
R492 100k
C373 47u 16V
C361 0.01u B
JL304
JL305
JL306
JL307
D IN
VCC
GND
IC309 HVE0024
OPTICAL
EXCEPT HK,SP,AUS,CN
C357-360 100p :HK,SP,AUS,CN 470p :EXCEPT HK,SP,AUS,CN
R486 470
R410 1k
Q330 2SD1938(F)-T(TX).SO FNAC MUTE
R487 470
R411 1k
Q331 2SD1938(F)-T(TX).SO FNAC MUTE
R488 470
R412 1k
Q332 2SD1938(F)-T(TX).SO FNAC MUTE
R489 470
R413 1k
Q333 2SD1938(F)-T(TX).SO FNAC MUTE
J302 LINE OUT
FB310
FB311
FB312
FB313
FB314
FB315
FB316
JL308
JL309
JL310
JL311
JL312
JL313
JL314
JL315
JL316
JL317
R
L
AUDIO
VIDEO
S-VIDEO
IC308
L304 100uH
R472 10k
IC308 BA7660F-E2
VIDEO BUFFER
VMUTE
VIDEOY
VIDEOV
VIDEOC
VS
6dB
75
C350 470u 6.3V
C346 100u 10V
C351 470u 6.3V
C347 100u 10V
C348 0.1u B
R476 68
R477 68
R478 68
R479 68
R480 68
R481 68
D309 HZM6.8ZWA1TL
Q324 UN2111-TX
Q323 UN2213-TX
R475 10k
R473 10k
C352 47u 16V
C353 0.01u B
Q323,324 DC ON/OFF
FB306
FB307
FB308
D308 HZM6.8ZWA1TL
D310 HZM6.8ZWA1TL
D311 HZM6.8ZWA1TL
J303 WOOFER OUT
C362 100p CH
FB320
05

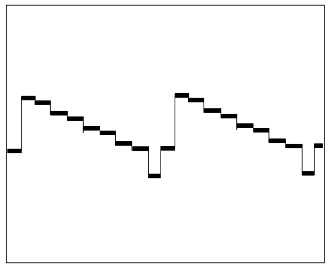
NO MARK:DVD/CD PLAY

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨⇨	⇨⇨⇨	⇨

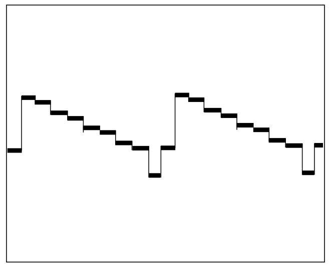
• Waveforms

❶ IC308 ②



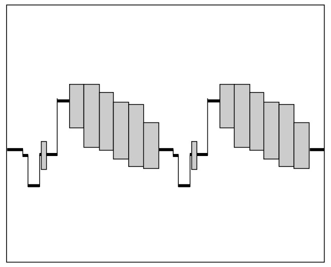
1.1 Vp-p (H)

❻ IC308 ⑮



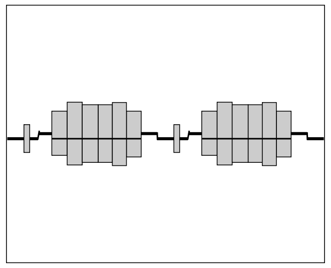
2.0 Vp-p (H)

❷ IC308 ④



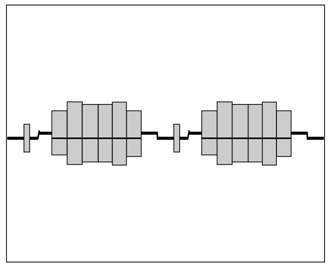
1.2 Vp-p (H)

❸ IC308 ⑦



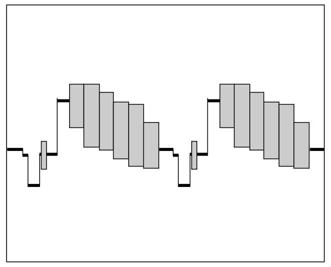
860 mVp-p (H)

❹ IC308 ⑩



1.8 Vp-p(H)

❺ IC308 ⑬



2.4 Vp-p (H)

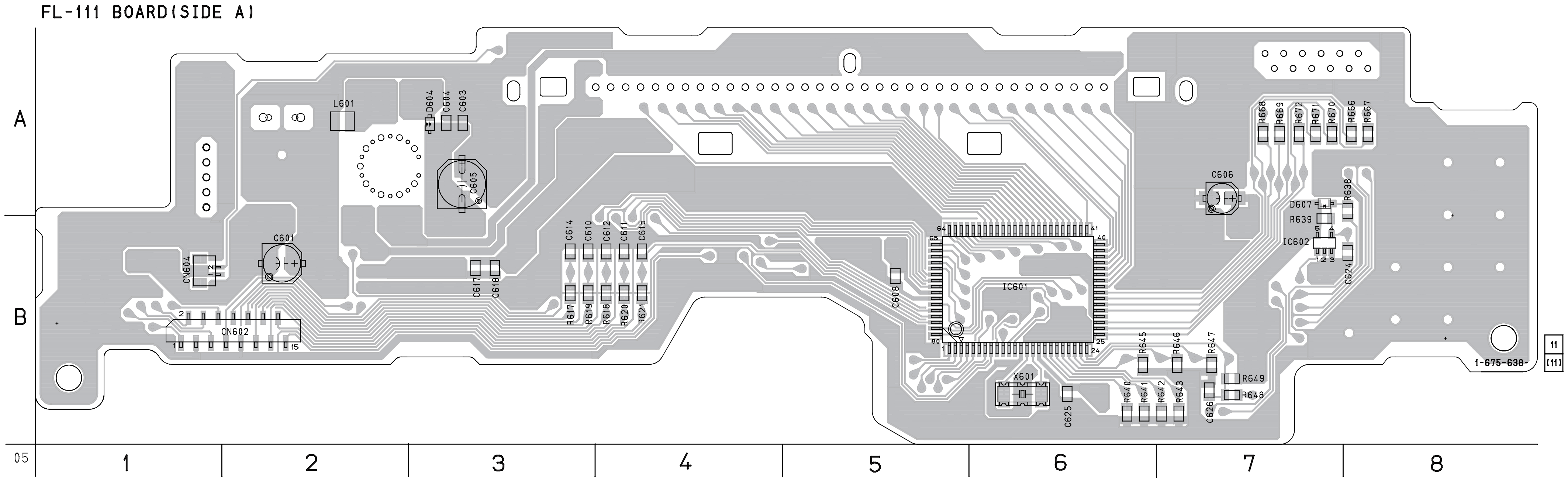
FL-111 (IF CON) PRINTED WIRING BOARD

– Ref. No.: FL-111 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

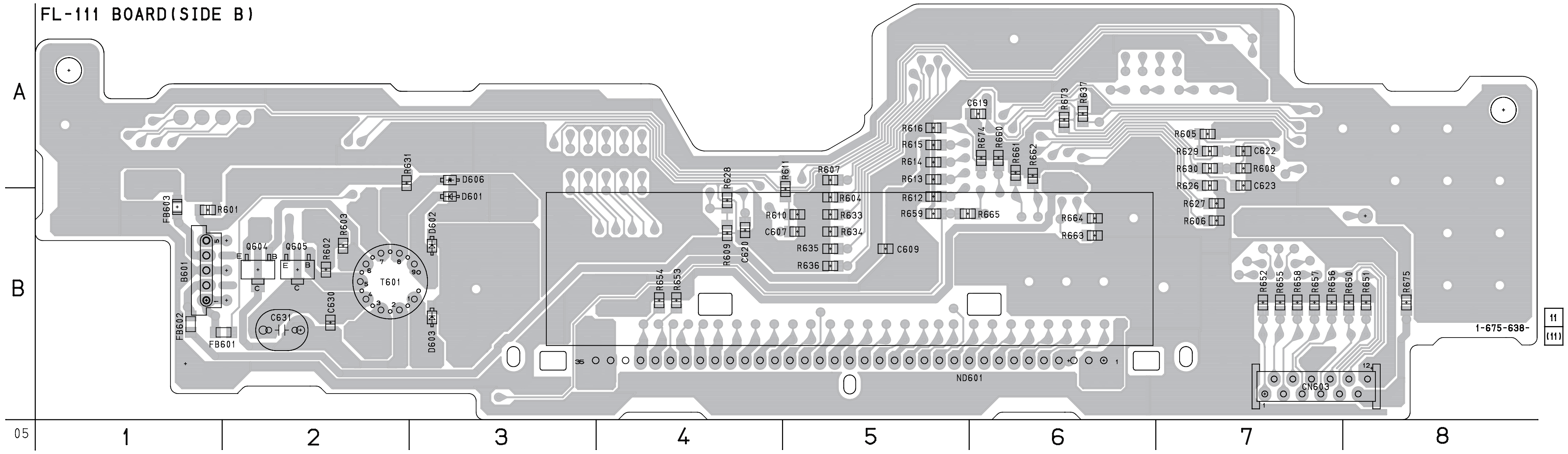
FL-111 BOARD (SIDE A)

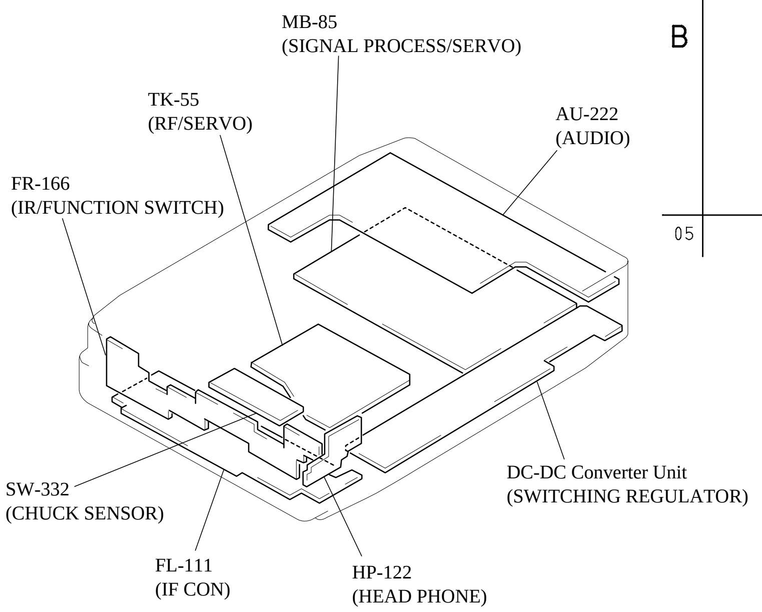
CN602	B-2
CN604	B-1
D604	A-3
D607	A-7
IC601	B-6
IC602	B-7


FL-111 BOARD(SIDE A)
A
B
05
1
2
3
4
5
6
7
8
L601
D604
C604
C603
C605
C601
CN604
CN602
C617
C618
C614
C610
C612
C611
C615
R617
R619
R618
R620
R621
C608
IC601
X601
C625
R640
R641
R642
R643
R645
R646
R647
C626
R649
R648
C606
D607
R639
IC602
R638
C624
R668
R669
R672
R671
R670
R666
R667
1-675-638-
11
(11)

FL-111 BOARD (SIDE B)

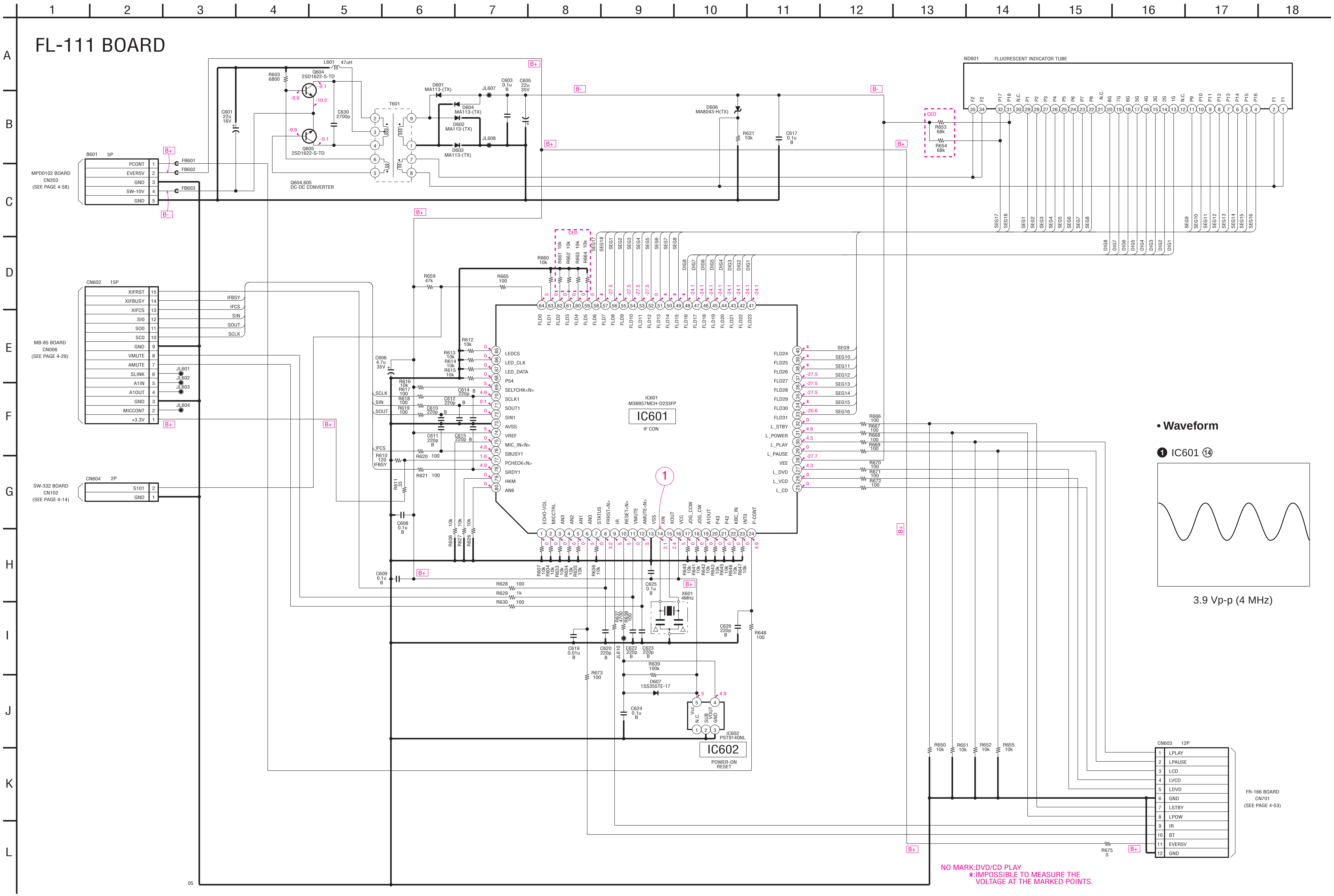
CN603	B-7
D601	B-3
D602	B-3
D603	B-3
D606	A-3
Q604	B-2
Q605	B-2


FL-111 BOARD(SIDE B)
A
B
05
1
2
3
4
5
6
7
8
FB603
R601
B601
FB602
FB601
Q604
Q605
R602
R603
C630
C631
T601
R631
D606
D601
D602
D603
R628
R609
C620
R611
R607
R604
R633
R634
R610
C607
R635
R636
C609
R654
R653
C619
R616
R615
R614
R613
R612
R659
R665
R674
R660
R661
R662
R673
R637
R664
R663
R605
R629
R630
R626
R627
R606
C622
R608
C623
R652
R655
R658
R657
R656
R650
R651
R675
CN603
ND601
1-675-638-
11
(11)


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

FL-111 (IF CON) SCHEMATIC DIAGRAM

– Ref. No.: FL-111 board; 2,000 series –


FL-111 BOARD
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
A B C D E F G H I J K L
MPD0102 BOARD CN203 (SEE PAGE 4-58)
B601 5P
PCONT
EVER5V
GND
SW-10V
GND
FB601
FB602
FB603
L601 47uH
Q604 2SD1622-S-TD
Q605 2SD1622-S-TD
Q604,605 DC-DC CONVERTER
T601
D601 MA113-(TX)
D602 MA113-(TX)
D603 MA113-(TX)
D604 MA113-(TX)
D606 MA8043-H(TX)
JL607
JL608
C601 22u 16V
C630 2700p
C603 0.1u B
C605 22u 35V
C617 0.1u B
R631 10k
R603 6800
ND601 FLUORESCENT INDICATOR TUBE
CED
R653 68k
R654 68k
MB-85 BOARD CN006 (SEE PAGE 4-29)
CN602 15P
XIFRST
XIFBUSY
XIFCS
SIO
SOO
SCO
GND
VMUTE
AMUTE
SLINK
A1IN
A1OUT
GND
MICCONT
+3.3V
IFBSY
IFCS
SIN
SOUT
SCLK
JL601
JL602
JL603
JL604
SW-332 BOARD CN102 (SEE PAGE 4-14)
CN604 2P
S101
GND
IC601 M38857MCH-D233FP
IC601
IF CON
LEDCS
LED_CLK
LED_DATA
P54
SELFCHK<N>
SCLK1
SOUT1
SIN1
AVSS
VREF
MIC_IN<N>
SBUSY1
PCHECK<N>
SRDY1
HKM
AN6
FLD24
FLD25
FLD26
FLD27
FLD28
FLD29
FLD30
FLD31
L_STBY
L_POWER
L_PLAY
L_PAUSE
VEE
L_DVD
L_VCD
L_CD
ECHO-VOL
MICCTRL
AN3
AN2
AN1
AN0
STATUS
FRRST<N>
IR
RESET<N>
VMUTE
AMUTE<N>
VSS
XIN
XOUT
VCC
JOG_CCW
JOG_CW
A1OUT
P43
P42
KBC_IN
INT0
P-CONT
X601 4MHz
IC602 PST9140NL
IC602
POWER-ON RESET
D607 1SS355TE-17
R639 100k
R673 100
C624 0.1u B
C625 0.1u B
C626 220p B
R648 100
CN603 12P
LPLAY
LPAUSE
LCD
LVCD
LDVD
GND
LSTBY
LPOW
IR
BT
EVER5V
GND
FR-166 BOARD CN701 (SEE PAGE 4-53)
R650 10k
R651 10k
R652 10k
R655 10k
R675 0
B+
B-
1
05

NO MARK:DVD/CD PLAY
∗:IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

• Waveform

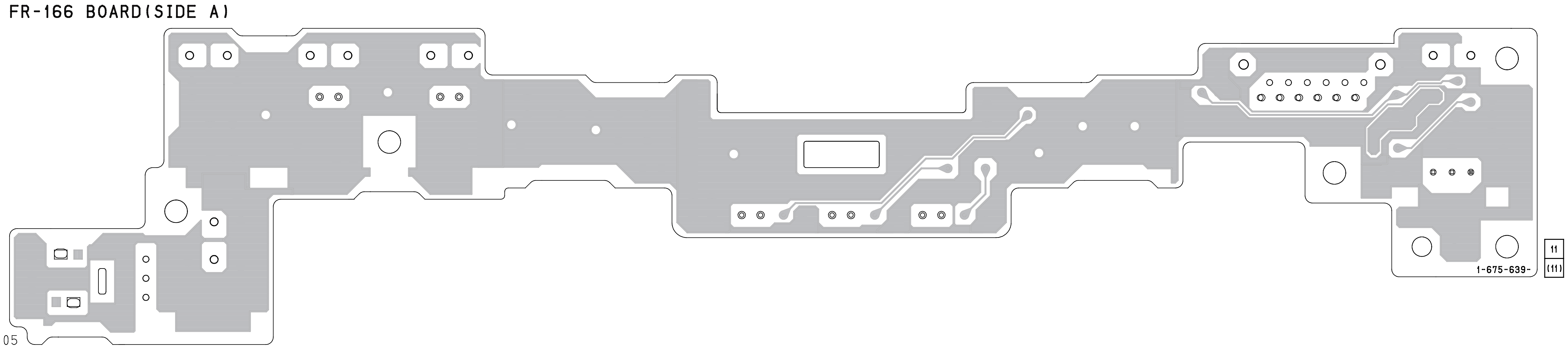
❶ IC601 ⑭

3.9 Vp-p (4 MHz)

There are few cases that the part isn't mounted in this model is printed on this diagram.

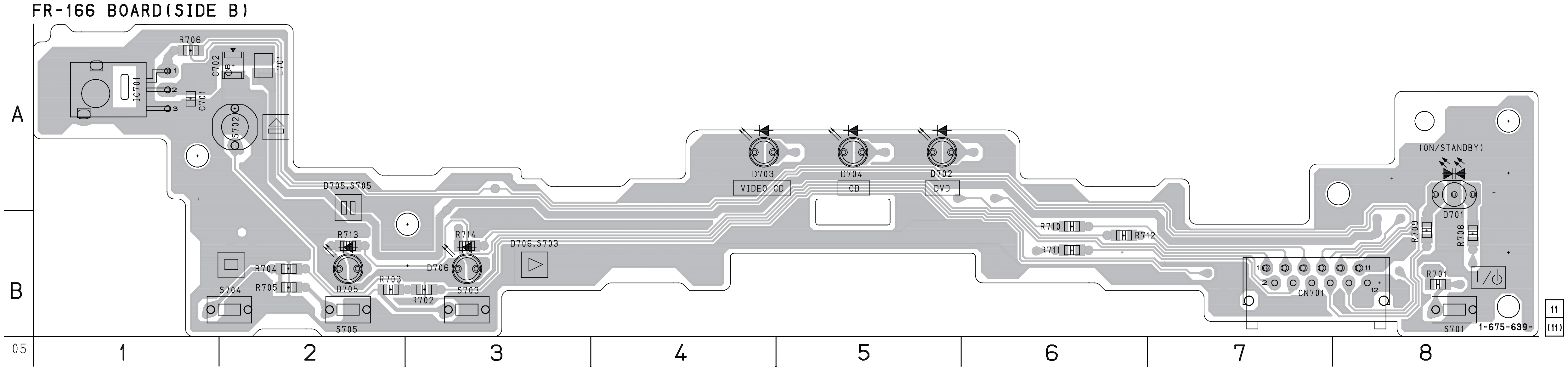
FR-166 (IR/FUNCTION SWITCH) PRINTED WIRING BOARD

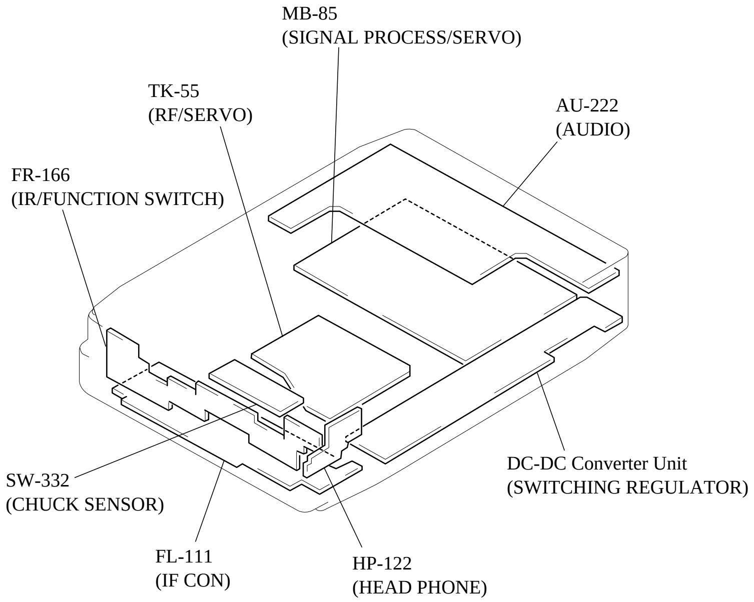
– Ref. No.: FR-166 board; 2,000 series –


FR-166 BOARD(SIDE A)
1-675-639-
11
(11)
05

FR-166 BOARD (SIDE B)

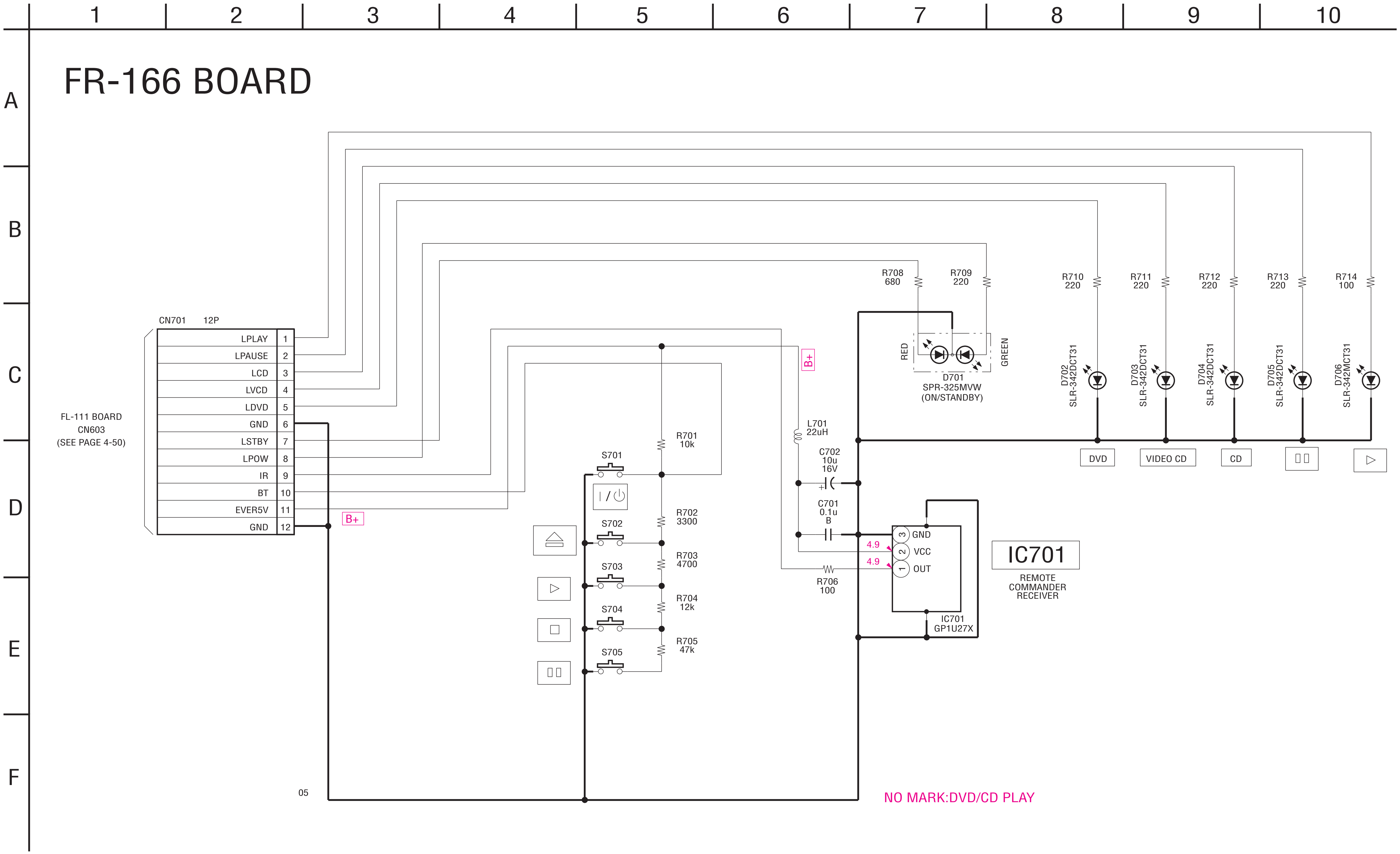
CN701	B-7
D701	A-8
D702	A-5
D703	A-4
D704	A-5
D705	B-2
D706	B-3
IC701	A-1


FR-166 BOARD(SIDE B)
A
B
R706
C702
L701
IC701
C701
S702
D705,S705
R713
R714
D706,S703
R704
R705
S704
R703
R702
D705
S705
D706
S703
D703
VIDEO CD
D704
CD
D702
DVD
R710
R711
R712
R709
R708
(ON/STANDBY)
D701
CN701
R701
S701
1-675-639-
11
(11)
05
1
2
3
4
5
6
7
8


MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

FR-166 (IR/FUNCTION SWITCH) SCHEMATIC DIAGRAM

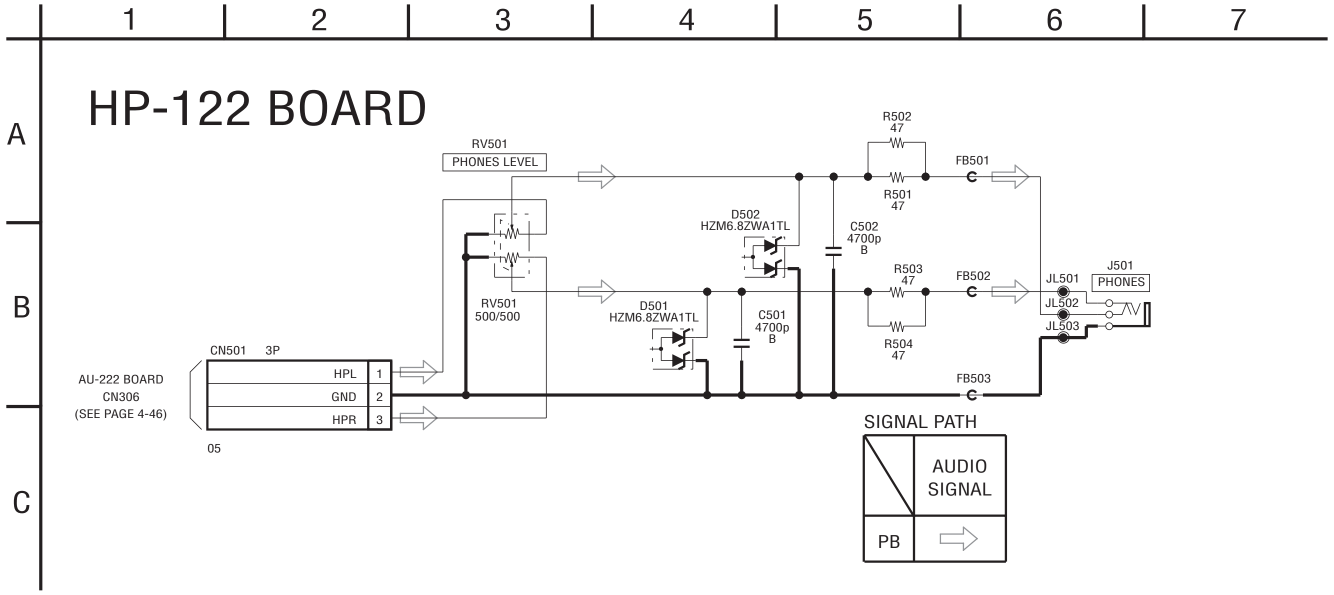
– Ref. No.: FR-166 board; 2,000 series –

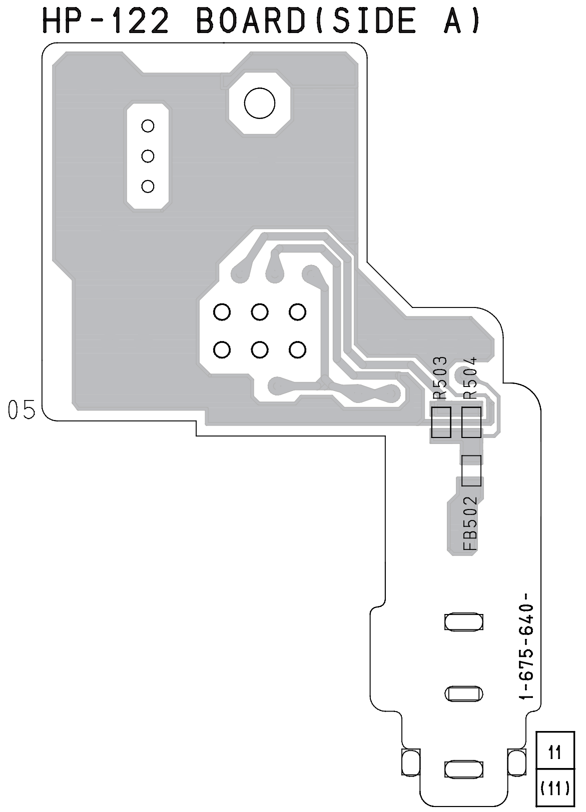

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
FR-166 BOARD
CN701 12P
LPLAY 1
LPAUSE 2
LCD 3
LVCD 4
LDVD 5
GND 6
LSTBY 7
LPOW 8
IR 9
BT 10
EVER5V 11
GND 12
FL-111 BOARD
CN603
(SEE PAGE 4-50)
B+
R701 10k
S701
I / ⏻
R702 3300
S702
⏏
R703 4700
S703
▷
R704 12k
S704
□
R705 47k
S705
▯▯
B+
L701 22uH
C702 10u 16V
C701 0.1u B
R706 100
4.9
4.9
3 GND
2 VCC
1 OUT
IC701 GP1U27X
IC701
REMOTE COMMANDER RECEIVER
R708 680
R709 220
RED
GREEN
D701
SPR-325MVW
(ON/STANDBY)
R710 220
R711 220
R712 220
R713 220
R714 100
D702 SLR-342DCT31
D703 SLR-342DCT31
D704 SLR-342DCT31
D705 SLR-342DCT31
D706 SLR-342MCT31
DVD
VIDEO CD
CD
▯▯
▷
05
NO MARK:DVD/CD PLAY

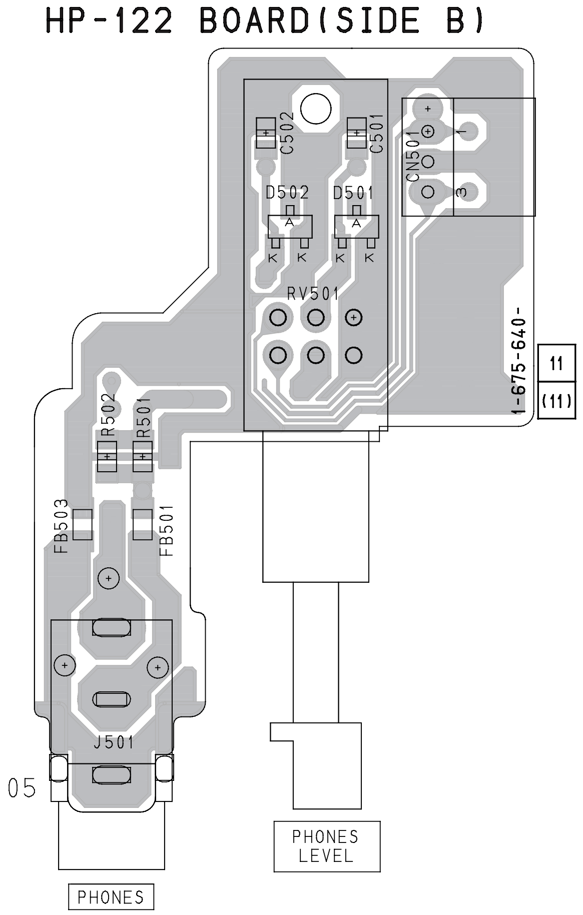
HP-122 (HEADPHONE) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

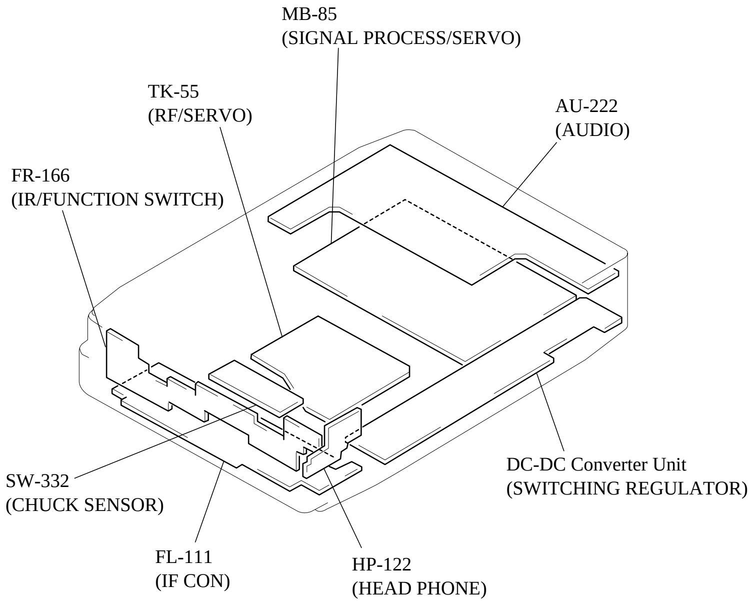
– Ref. No.: HP-122 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.


1
2
3
4
5
6
7
A
B
C
HP-122 BOARD
RV501
PHONES LEVEL
RV501
500/500
CN501 3P
HPL 1
GND 2
HPR 3
AU-222 BOARD
CN306
(SEE PAGE 4-46)
05
D502
HZM6.8ZWA1TL
D501
HZM6.8ZWA1TL
C502
4700p
B
C501
4700p
B
R502
47
R501
47
R503
47
R504
47
FB501
FB502
FB503
JL501
JL502
JL503
J501
PHONES
SIGNAL PATH
AUDIO SIGNAL
PB


HP-122 BOARD(SIDE A)
05
R503
R504
FB502
1-675-640-
11
(11)


HP-122 BOARD(SIDE B)
C502
C501
CN501
1
3
D502
D501
A
K
RV501
1-675-640-
11
(11)
R502
R501
FB503
FB501
J501
05
PHONES
PHONES LEVEL

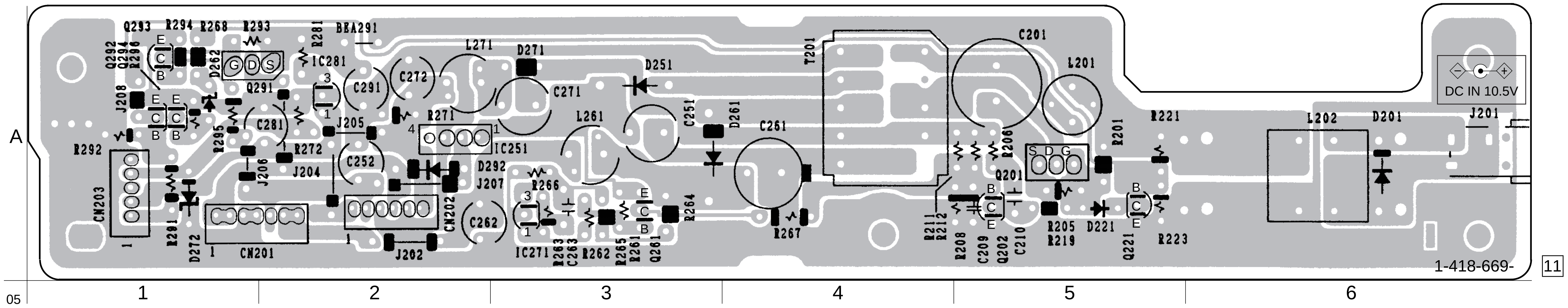

MB-85
(SIGNAL PROCESS/SERVO)
TK-55
(RF/SERVO)
AU-222
(AUDIO)
FR-166
(IR/FUNCTION SWITCH)
SW-332
(CHUCK SENSOR)
DC-DC Converter Unit
(SWITCHING REGULATOR)
FL-111
(IF CON)
HP-122
(HEAD PHONE)

MPD0102 (SWITCHING REGULATOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: MPD0102 board; 6,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

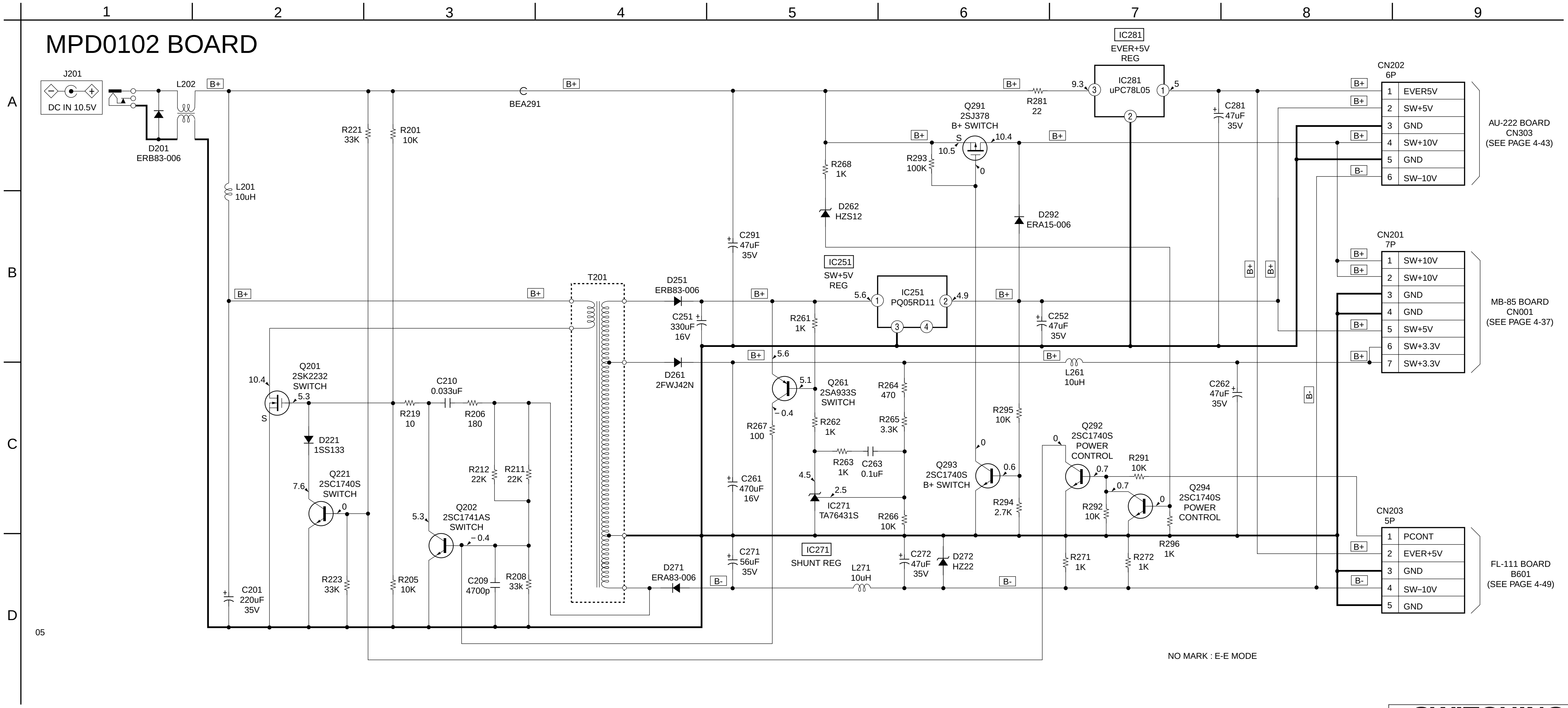
MPD0102 BOARD



Q293 R294 R268 R293 R281 BEA291
Q292 Q294 R296
E C B
D262
G D S
Q291
IC281
J208
E E C C B B
R295
C281
R272
J205
C291
C272
L271
D271
C271
D251
R271
IC251
L261
C251
D261
C261
T201
C201
L201
R221
L202
D201
J201
DC IN 10.5V
R292
CN203
R291
D272
CN201
J206
J204
C252
D292
J207
J202
CN202
C262
R266
IC271
R263 C263
R262
R265 R261
Q261
R264
R267
R211 R212
R208
C209
Q202
C210
R206
R205 R219
Q201
S D G
D221
R201
B C E
Q221
R223
1-418-669-
11
05
1 2 3 4 5 6
A

MPD0102 BOARD	
CN201	A-1
CN202	A-2
CN203	A-1
D201	A-6
D221	A-5
D251	A-3
D261	A-3
D262	A-1
D271	A-3
D272	A-1
D292	A-2
IC251	A-2
IC271	A-3
IC281	A-2
Q201	A-5
Q202	A-5
Q221	A-5
Q261	A-3
Q291	A-1
Q292	A-1
Q293	A-1
Q294	A-1

MPD0102 BOARD



1 2 3 4 5 6 7 8 9
A B C D
J201
DC IN 10.5V
D201 ERB83-006
L202
B+
L201 10uH
C201 220uF 35V
BEA291
R221 33K
R201 10K
IC281 EVER+5V REG
IC281 uPC78L05
9.3
5
R281 22
C281 47uF 35V
Q291 2SJ378 B+ SWITCH
10.5
10.4
0
R293 100K
R268 1K
D262 HZS12
D292 ERA15-006
C291 47uF 35V
IC251 SW+5V REG
IC251 PQ05RD11
5.6
4.9
C252 47uF 35V
T201
D251 ERB83-006
C251 330uF 16V
R261 1K
D261 2FWJ42N
L261 10uH
C262 47uF 35V
B-
Q201 2SK2232 SWITCH
10.4
5.3
S
D221 1SS133
Q221 2SC1740S SWITCH
7.6
0
R223 33K
C210 0.033uF
R219 10
R206 180
R212 22K
R211 22K
Q202 2SC1741AS SWITCH
5.3
– 0.4
R205 10K
C209 4700p
R208 33K
Q261 2SA933S SWITCH
5.6
5.1
– 0.4
R267 100
R264 470
R262 1K
R265 3.3K
R263 1K
C263 0.1uF
4.5
2.5
IC271 TA76431S
IC271 SHUNT REG
R266 10K
C261 470uF 16V
C271 56uF 35V
D271 ERA83-006
L271 10uH
C272 47uF 35V
D272 HZ22
Q293 2SC1740S B+ SWITCH
0
0.6
R295 10K
R294 2.7K
Q292 2SC1740S POWER CONTROL
0
0.7
R291 10K
R292 10K
Q294 2SC1740S POWER CONTROL
0.7
0
R296 1K
R271 1K
R272 1K
CN202 6P
1 EVER5V
2 SW+5V
3 GND
4 SW+10V
5 GND
6 SW–10V
AU-222 BOARD CN303 (SEE PAGE 4-43)
CN201 7P
1 SW+10V
2 SW+10V
3 GND
4 GND
5 SW+5V
6 SW+3.3V
7 SW+3.3V
MB-85 BOARD CN001 (SEE PAGE 4-37)
CN203 5P
1 PCONT
2 EVER+5V
3 GND
4 SW–10V
5 GND
FL-111 BOARD B601 (SEE PAGE 4-49)
NO MARK : E-E MODE
05

SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL PIN FUNCTION (MB-85 BOARD IC202)

Pin No.	Pin name	I/O	Function
1	PB5	O	Analog filter gain control
2	PB6	O	VES gain control “H”: VES
3	PB7	O	Rear CH boost control “H”: rear boost
4	VCC3	-	Power supply
5	CLK	O	CPU clock out (25 MHz)
6	$\overline{\text{CS5}}$	O	Not used
7	$\overline{\text{CS4}}$	O	Chip select signal for ARP, SERVO DSP and HGA
8	$\overline{\text{CS3}}$	O	Chip select signal for SDRAM and AV DEC
9	$\overline{\text{CS2}}$	O	Chip select signal for REG and AV DEC
10	$\overline{\text{CS1}}$	O	Chip select signal for external SRAM
11	$\overline{\text{CS0}}$	O	Chip select signal for external FLASH ROM
12	$\overline{\text{NMI}}$	I	Not used (fixed at “H”)
13	$\overline{\text{HST}}$	I	Not used (fixed at “H”)
14	$\overline{\text{RST}}$	I	Reset signal input from IF CON
15	GND	-	Ground
16	MD0	I	Input of mode select 0 (fixed at “1”)
17	MD1	I	Input of mode select 1 (fixed at “0”)
18	MD2	I	Input of mode select 2 (fixed at “0”)
19	RDY	I	Wait signal input
20	P81	I	Test terminal (fixed at “H”)
21	P82	I	Test terminal (fixed at “L”)
22	$\overline{\text{RD}}$	O	Read enable signal output
23	$\overline{\text{WR0}}$	O	High byte write enable signal output (16 bit and 8 bit)
24	$\overline{\text{WR1}}$	O	Low byte write enable signal output (16 bit only)
25-32	D16-D23	I/O	Data bus D0-D7 (16 bit)
33-39	D24-D30	I/O	Data bus D8-D14 (16 bit), D0-D6 (8 bit)
40	GND	-	Ground
41	D31	I/O	Data bus D15 (16 bit), D7 (8 bit)
42	A00	O	Address bus A0
43	VCC5	-	Power supply
44-64	A01-A21	O	Address bus A1-A21
65	GND	-	Ground
66	P66	O	PLL IC control output “H”: DOUBLE
67	P67	I	DIAG mode signal input “L”: DIAG
68	EOP0	I	Not used
69	AVCC	-	Power supply
70	AVRH	-	Reference power supply (+3.3V)
71	AGND	-	Ground
72	AN0	I	Set of mode 0
73	AN1	I	Set of mode 1
74	AN2	I	Set of mode 2
75	AN3	I	Set of mode 3 (fixed at “H”)
76	SI0	I	Serial data input from IF CON and EEPROM
77	SO0	O	Serial data output to IF CON and EEPROM
78	SC0	O	Serial clock output to IF CON and EEPROM
79	SI1	I	Serial bus 1 (for data input)
80	SO1	O	Serial bus 1 (for data output)
81	SI2	I	Serial bus 2 (for data input)
82	SO2	O	Serial bus 2 (for data output)
83	PF7	O	Reset signal output
84	DACK1	O	Output of DMA-ACK 0 to AV DEC
85	DACK0	O	Output of DMA-ACK 1 to AV DEC
86	DREQ1	I	Input of DMA-REQ 0 from AV DEC
87	DREQ0	I	Input of DMA-REQ 1 from AV DEC
88	INT3	I	Input of interrupt from HGA
89	SC1	O	Serial clock output
90	GND	-	Ground
91	X1	O	Clock output (12.5MHz)
92	X0	I	Clock input (12.5MHz)
93	VCC5	-	Power supply
94	INT1	I	Input of interrupt ARP and SERVO DSP
95	INT0	I	Input of interrupt from AV DEC
96	PB0	I	Rear panel lime input select (“H”: DISC “L”: EXT)
97	PB1	O	Chip select signal to IF CON
98	PB2	O	Chip select signal to DAC (Lt and Rt)
99	PB3	O	Chip select signal to DAC (L and R)
100	PB4	O	DVD/CD select (“H”: 44.1kHz “L”: 48kHz)

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press TITLE, CLEAR, POWER buttons on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed.
To execute each function, select the desired menu and press its number on the remote commander.
To exit from the Test Mode, press the POWER button.

```
Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emergency History
5. Version Information
6. Video Level Adjustment
Exit: Power Key
_
Model    : DPX12xxxx
Revision : 1.xxxx
```

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander.
On the Test Mode Menu screen, press 0 key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. Quit

Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. All

All items continuous check
This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

Diag All Check
No. 2 Version

 2-3. ROM Check Sum
Check Sum = xxxx



Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press NEXT key to go to the next item, or PREV key to repeat the same check again. To quit the diagnosis and return to the Check Menu screen, press STOP or ENTER key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###




 3-3. EEPROM Check
Error 03: EEPROM Write/Reed N
Address    : 00000001
Write Data : 2492
Read Data  : 2490
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

Press STOP key to quit the diagnosis, or PREV key to repeat the same item where an error occurred, or NEXT key to continue the check from the item next to faulty item.

Submenu
Selecting 2 and subsequent items calls the submenu screen of each item.
For example, if “5. Supply” is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
          No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. Quit

Quit the submenu and return to the main menu.

1. All

All submenu items continuous check
This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.

Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see “Check Items List”.

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file of ROM (IC205 or IC206) is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
The 8-bit data are added at addresses 0x000F0000 ~ 0x002EFFFF of ROM (IC205 or IC206) and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code read from EEPROM (IC201) is displayed with 2-digit hexadecimal number.

	Model Type	
Hong Kong, Singapore	8	1
Australian	8	3
EXCEPT Hong Kong, Singapore, Australian, Chinese	8	2
Chinese	8	4

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

3. Peripheral

(3-2) Gate Array Check
Data write → read, and accord check
Error 02: Gate array write/read discord
Data 0x00~0xFF are written to the address 0xF of GA (IC601), then read and checked if they accord.

(3-3) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
Data 0x9249, 0x2942, 0x4294 are written to addresses 0x00~0xFF of EEPROM (IC201), then read and checked. Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord
Data 0x9249, 0x2942, 0x4294 are written to the address 0x602 of RAM in the Servo DSP (IC701), then read and checked.

(4-3) DSP Driver Test
Test signal data → DSP Driver
Error: Not detected.

Caution: Do not conduct this test with a mechanical deck connected.

The maximum voltage is applied to the Servo Driver IC (IC801, IC802). If mechanical deck is connected, the motor and optics could be damaged. Disconnect mechanical deck following the output message, then enter specified 4- or 5-digit number from the remote commander, and press the ENTER. The test is conducted only when the input data accord. Check the output level, then press the NEXT to finish the test.
This test is skipped if “All” is selected.

Supplement: How to disconnect mechanical deck
Disconnect flat cables connected to the CN002 and CN003 of MB-85 board. Also, disconnect harness from the CN011.

5. Supply

Caution: Do not conduct this check with a mechanical deck connected.
An access is made to the stream supply and servo control IC (IC303) and external RAM (IC304) using check data. If mechanical deck is connected, the motor and optics could be damaged. This check is also executed by the “All” menu item.

Supplement: How to disconnect mechanical deck
Disconnect flat cables connected to the CN002 and CN003 of MB-85 board. Also, disconnect harness from the CN011.

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord
Data 0x00 to 0xFF are written to the TMAX register (address 0xC6) in ARP (IC303), then they are read and checked.

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC304) connected to the ARP (IC303) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP → RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).

Before starting the test, all addresses of RAM (IC304) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###




 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address    : 0000A55A
Write Data : 00000000
Read Data  : 00080000
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC304) connected to the ARP (IC303) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1930 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC205 or IC206) are copied to all areas of RAM (IC402, IC403) connected to the AVD (IC401) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.

(6-3) 1930 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM (IC205 or IC206) are transferred to the RAM (IC402, IC403) in AVD (IC401), and output as video signals from the AVD (IC401).
They are output from all video terminals (Composite, Y/C) except EURO AV terminal.

7. Video

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.
They are output from all video terminals (Composite, Y/C) except EURO AV terminal.

8. Audio

(8-2) ARP → 1930
Error 14: ARP → 1930 video NG
15: ARP → 1930 audio NG

(8-3) Test Tone
A pink noise signal is output from the AVD (IC401) through optical coaxial digital terminal and analog audio terminal.
Error: Not detected.
All channels → 2ch Left → 2ch Right → Front Left → Front Right → Rear Left → Rear Right → Center → Sub Woofer are checked in this order.
Caution: Sub Woofer is checked only for low-frequency components, and no sound will be heard unless a proper super woofer is connected.

Check Items List

2) Version
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region

3) Peripheral
(3-2) Gate Array Check
(3-3) EEPROM Check

4) Servo
(4-2) Servo DSP Check
(4-3) DSP Driver Test

5) Supply
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6) AV Decoder
(6-2) 1930 RAM
(6-3) 1930 SP

7) Video
(7-2) Color Bar

8) Audio
(8-2) ARP → 1930
(8-3) Test Tone

Error Codes List

00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: 1930 SDRAM NG
14: ARP → 1930 video NG
15: ARP → 1930 audio NG
16: 1910 UCODE download NG
17: System call error (function not supported)
18: System call error (parameter error)
19: System call error (illegal ID number)
20: System call error (time out)
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press 1 key on the remote commander, and the drive auto adjustment menu will be displayed.

```
   ## Drive Auto Adjustment ##

         Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. SACD



                  Exit: RETURN
```

Normally, 0 is selected to adjust DVD (single layer), CD, DVD (dual layer), and SACD in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen.
The disc used for adjustment must be the one specified for adjustment. However, for SACD disc, use the player with initial data if the disc is not available.

0. ALL

Select 0 and press ENTER key, and the servo set data in EEPROM will be initialized. Then, 1. DVD-SL disc, 2. CD disc, 3. DVD-DL disc, and 4. SACD disc are adjusted in this order. Each time one disc was adjusted, it is ejected. Replace it with the specified disc following the message. Though the message to confirm whether discs other than SACD disc are adjusted is not displayed, you can finish the adjustment if pressing the STOP button. During adjustment of each disc, the measurement for disc type judgment is made. As automatic adjustment does not judge the disc type unlike conventional models, take care not to insert wrong type discs. Also, do not give a shock during adjustment.

1. DVD-SL (single layer)

Select 1, insert DVD single layer disc, and press ENTER key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps

1. SLED TILT Reset
2. Disc Check Memory SL
3. Wait 300 msec
4. Set Disc Type SL
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Servo ON 0
9. Auto Track Offset Adjust
10. CLVA ON
11. Wait 500 msec
12. Tracking ON
13. Wait 1 sec
14. Sled ON
15. Check CLV Lock
16. Auto LFO Adjust
17. Auto Focus Offset Adjust
18. Auto Tilt Position Adjust
19. Auto Focus Gain Adjust
20. Auto Focus Offset Adjust
21. EQ Boost Adjust
22. Auto LFO Adjust
23. Auto Track Gain Adjust
    Search Check
24. 32Tj Fwd
25. 32Tj Rev
26. 500Tj Fwd
27. 500Tj Rev

28. All Servo Stop
29. Eep Copy Loop Filter Offset

2. CD

Select 2, insert CD disc, and press ENTER key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps
1. Sled Tilt Rest
2. Disc Check Memory CD
3. Wait 500 msec
4. Set Disc Type CD
5. LD ON
6. Spdl Start
7. Wait 500 msec
8. Focus Servo ON 0
9. Auto Track Offset Adjust

10. CLVA ON
11. Wait 500 msec
12. Tracking ON
13. (TC Display Start)
14. Wait 1 sec
15. Jitter Display Start
16. Sled ON
17. Check CLV ON
18. Auto LFO Adjust
19. Auto Focus Offset Adjust
20.
21. Auto Focus Gain Adjust
22. Auto Focus Offset Adjust
23. Eq Boost Adjust
24. Auto LFO Adjust
25. Auto Track Gain Adjust
    Search Check
26. 32Tj Fwd
27. 32Tj Rev
28. 500Tj Fwd
29. 500Tj Rev

30. All Servo Stop

3. DVD-DL (dual layer)

Select 3, insert DVD dual layer disc, and press ENTER key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps
1. Sled Tilt Reset
2. Disc Check Memory DL
3. Wait 500 msec
4. Set Disc Type DL
5. LD ON
6. Spdl Start
7. Wait 1 sec
    Layer 1 Adjust
8. Focus Servo ON 0
9. Auto Track Offset Adjust

10. Clva ON
11. Wait 500 msec
12. Tracking ON
13. Wait 500 msec
14. Sled ON
15. Check CLV Lock
16. Auto Loop Filter Offset Auto Focus Adjust
17.
18. Auto Focus Gain Adjust
19. Auto Focus Offset Adjust
20. Eq Boost Adjust
21. Auto Loop Filter Offset
22. Auto Track Gain Adjust
    Search Check
23. 32Tj Fwd
24. 32Tj Rev
25. 500Tj Fwd
26. 500Tj Rev
    Layer 0 Adjust
27. Fj (L1 -> L0)
28. Auto Track Offset Adjust L0

29. Clva ON
30. Wait 500 msec
31. Tracking ON
32. Wait 500 msec
33. Sled ON
34. Check CLV Lock
35. Auto Focus Filter Offset
36. Auto Focus Adjust
37.
38. Auto Focus Gain Adjust
39. Auto Focus Offset Adjust
40. Eq Boost Adjust
41. Auto Loop Filter Offset
42. Auto Track Gain Adjust
    Search Check
43. 32Tj Fwd
44. 32Tj Rev
45. 500Tj fwd
46. 500Tj Rev
    Layer Jump Check
47. Lj (L0 -> L1)
48. Lj (L1 -> L0)

49. All Servo Stop

4. SACD

Select 4, insert SACD disc, and press ENTER key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. However, if SACD disc is not available, use the player with initial data, skipping the SACD adjustment. In this case, you can finish the adjustment if pressing the STOP button.

SACD Adjustment Steps

1. Sled Tilt Reset
2. Set Disc Type CD
3. LD ON
4. Spdl Start
5. Wait 500 msec
6. Focus Servo ON 0
7. Auto track Offset Adjust
8.
9. CLVA ON
10. Wait 500 msec
11. Tracking ON
12. Wait 1 sec
13. Sled ON
14. Check CLV ON
15. Auto Focus Offset Adjust
17.
18. Auto Focus Gain Adjust
19. Auto Focus Offset Adjust
20. Eq Boost Adjust
21. Auto LFO Adjust
22. Auto Track Gain Adjust

23. 32Tj Fwd
24. 32Tj Rev
25. 500Tj Fwd
26. 500Tj Rev

27. All Servo Stop

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select 2, and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
  ## Drive Manual Operation ##

         Operation Menu
1. Disc type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

                Exit: Return
```

In using the manual operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type screen.
   The disc type must be set after a disc was loaded.
   The set disc type is cleared when the tray is opened.
2. After power ON, if the Drive Manual Operation was selected, first perform “Reset SLED TILT” by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the STOP button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

POWER	Power OFF
STOP	Servo stop
OPEN/CLOSE	Stop+Eject/Loading
RETURN	Return to Operation Menu or Test Mode Menu
NEXT, PREV	Transition between sub modes of menu
1 to 9, 0	Selection of menu items
Cursor UP/DOWN	Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
             Disc Check



1. SL Disc Check
2. CD Disc Check
3. DL Disc Check




0. Reset SLED TILT
```

On this screen, the mirror time is measured to judge the disc and it is written to the EEPROM. First load DVD SL disc and press 1, next load CD disc and press 2, and finally load DVD DL disc and press 3.

The adjustment must be executed more than once after default data were written. External vibration or shock to the player must not be given. Reference value for DVD is from 10 to 20, and for CD, from 28 to 4F.

Check that the value of CD is larger than that of DVD.

When those values are beyond a range perform this adjustment again.

From this screen, you can go to another mode by pressing NEXT or PREV key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
              Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting 1 automatically selects and displays the disc type. In case of wrong display, retry “Disc Check Memory”. Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.

In performing manual operation, the disc type must be set.

Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
              Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
        SA.____  SI.___ EMG. 00
DVD SL 12 cm
```

Display when DVD SL 12cm disc was selected

```
              Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
         TC.___:___:___ EMG. 00
CD   12 cm
```

Display when CD 12cm disc was selected

0 Reset SLED TILT	Reset the Sled and Tilt to initial position.
1 Disk Type Check	Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).
2 to 9	Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if 1 was selected.

2. Servo Control

```
           Servo Control
1. LD          Off R.Sled FWD
2. SP          Off L.Sled REV
3. Focus       Off
4. TRK.        Off
5. Sled        Off
6. CLVA        Off
7. FCS. Srch Off


0. Reset SLED TILT
        SA.____  SI.___ EMG. 00
DVD SL 12 cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.

The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

0	Reset SLED TILT	Reset the Sled and Tilt to initial position.
1	LD	Turn ON/OFF the laser.
2	SP	Turn ON/OFF the spindle.
3	Focus	Search the focus and turn on the focus.
4	TRK	Turn ON/OFF the tracking servo.
5	Sled	Turn ON/OFF the sled servo.
6	CLVA	Turn ON/OFF normal servo of spindle servo.
7	FCS. Srch	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
→	Sled FWD	Move the sled outward. Perform this operation with the tracking servo turned off.
←	Sled REV	Move the sled inward. Perform this operation with the tracking servo turned off.
↑	Tilt UP	Move the tilt upward.
↓	Tilt DOWN	Move the tilt downward.

The following menus are normally not used.

3. Track/Layer Jump

4. Manual Adjustment

5. Auto Adjustment

The persons who do not know well about these menus should not use them.

6. Memory Check

```
EEPROM DATA
                 CD      – DVD –
ID No. 00       SACD    SL  L0  L1
Focus Gain     xx xx    xx  xx  xx
TRK. Gain      xx xx    xx  xx  xx
Focus Offset   xx xx    xx  xx  xx
TRK. Offset    xx xx    xx  xx  xx
L. F. Offset   xx xx    xx  xx  xx
EQ Boost       xx xx    xx  xx  xx
Jitter         xx xx    xx  xx  xx
Mirror Time    xx xx    xx  xx  xx
_
CLEAR: Default Set
```

This screen displays current servo adjusted data stored in the EEPROM. Though adjusted data can be initialized with the CLEAR key, they cannot be restored after initialization.
So, before clearing, make a note of the adjusted data.
For reference, the drive has been designed so that the gain center value is 20 and offset value is 80. Other values will be in a range of 10 to 80. If extreme value such as 00 or FF is set, adjustment will be faulty. In such a case, check for disc scratch or cable disconnection, then perform adjustment again.

6-6. MECHA AGING

```
       ### Mecha Aging ###



Press OPEN key




Abort: STOP key

```

On the Test Mode Menu screen, selecting 3 executes the aging of mechanism. First, open the tray and load a disc. Press the PLAY key, and the aging will start. When the tray is closed, the disc type and size are judged and displayed. During aging, the repeat cycle is displayed. Aging can be aborted at any time by pressing the STOP key. After the operation has stopped, unload the disc and press again the STOP key or the RETURN key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
      ### MEG. History ###

Laser Hours     CD   xxxxxxxh
                DVD  xxxxxxxh

1. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

2. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

Select: 1 – 9   Scroll: UP/DOWN
(1: Last EMG.)   Exit: Return
```

On the Test Mode Menu screen, selecting 4 displays the information such as servo emergency history. The history information from last 1 up to 10 can be scrolled with ↑ key or ↓ key. Also, specific information can be displayed by directly entering that number with ten keys.

The upper two lines display the laser ON total hours. Data below minutes are omitted.

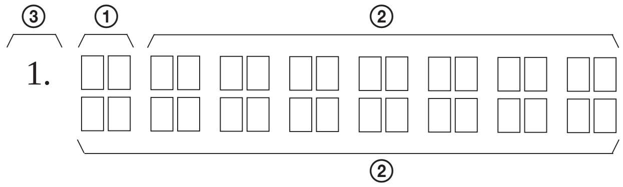
Clearing History Information

◎ Clearing laser hours
Press DISPLAY and CLEAR keys in this order.
Both CD and DVD data are cleared.

◎ Clearing emergency history
Press TITLE and CLEAR keys in this order.

◎ Initializing set up data
Press DVD and CLEAR keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed. The EMG. History screen will be restored soon.

How to see Emergency History



① : Emergency Code
② : Don’t Care
These codes are used for verification of software designing.
③ : Historical order 1 to 9

Emergency Codes List
10: Communication to IC001 (TK-55 board) failed.
11: Each servo for focus, tracking, and spindle is unlocked.
12: Communication to EEPROM, IC201 (MB-85 board) failed.
13: Writing of hours meter data to EEPROM, IC201 (MB-85 board) failed.
14: Communication to Servo DSP IC701 (MB-85 board) failed, or Servo DSP is faulty.
20: Initialization of tilt servo and sled servo failed. They are not placed in the initial position.
21: Tilt servo operation error
22: Syscon made a request to move the tilt servo to wrong position.
23: Sled servo operation error
24: Syscon made a request to move the sled servo to wrong position.
30: Tracking balance adjustment error
31: Tracking gain adjustment error
32: Focus balance adjustment error
33: Focus bias adjustment error
34: Focus gain adjustment error
35: Tilt servo adjustment error
36: RF equalizer adjustment error
37: RF group delay adjustment error
38: Jitter value after adaptive servo operation is too large.
40: Focus servo does not operate.
41: With a dual layer (DL) disc, focus jump failed.50: CLV (spindle) servo does not operate.
51: Spindle does not stop.
60: With a DVD disc, Syscon made a request to seek nonexistent address.
61: With a CD disc, Syscon made a request to seek nonexistent address.
62: With a CD disc, Syscon made a request to seek nonexistent track No. and index No.
63: With a DVD disc, seeking of target address failed.
64: With a CD disc, seeking of target address failed.
65: With a CD disc, seeking of target index failed.
70: With a DVD disc, physical information data could not be read.
71: With a CD disc, TOC data could not be read.
80: Disc type judgment failed.
81: As disc type judgment failed, retry was repeated.
82: As disc type judgment failed, a measurement error occurred.
83: Disc type could not be judged within the specified time.
84: Illegal command code was received from Syscon.
85: Illegal command was received from Syscon.

6-8. VERSION INFORMATION

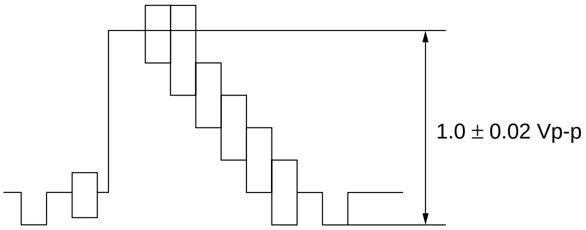
```
    ## Version Information ##

IF con.    Ver. x. xxx (xxxx)
           Group    00

SYScon.    Ver. x. xxx (xxxx)
           Model    xx
           Region   0x
           SW1      ??
           SW2      ??

Exit: RETURN
```

On the Test Mode Menu screen, selecting $\boxed{5}$ displays the ROM version and region code.
The parenthesized hexadecimal number in version field is checksum value of ROM.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting $\boxed{6}$ displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

Measurement point	: LINE OUT VIDEO (75 Ω terminating resistance)
Measuring instrument	: Oscilloscope
Adjustment device	: RV401 on MB-85 board
Specified value	: 1.0 ± 0.02 Vp-p



6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. FRONT BOARD TEST MODE

The front board test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following thecommands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remocon receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Direct search dial function
5. Click shuttle function
6. Fluorescent display tube lighting check
   Grid check
   Anode check
7. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (PCONT) of MB-85 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. HOW TO ENTER THE TEST MODE

The set must be placed in the Standby mode (red LED lights up). In the standby mode, press the RETURN key, then the SET UP key on the remocon while pressing the STOP button on the set, so that the set enters the test mode.

When the Test mode becomes active, the automatic display sequence of the FL display tube starts.

1. LEDs and FL display tube all light up for about 5 seconds.
2. Then, the prototypical model name is displayed.
   (This model name is a typical name of the series. As the button arrangement varies depending on the model, make sure the difference.)

Display	Model
DPX-1290	DVP-F11

3. Last updating date of the program is displayed.
   Example: 981211
4. Following the “GRID TEST” display, odd grids and even grids are blinking alternately (3 times).
5. Following the “ANODE TEST” display, even anodes and odd anodes are blinking alternately (3 times). For the FL display tube type A, even and odd numeric parts of music calendar are blinking alternately (3 times).
6. All light-up mode restores.

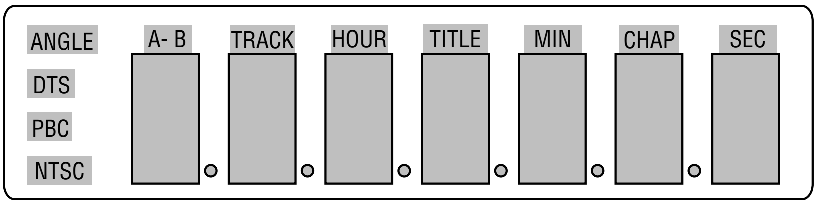
Steps 1 through 6 are repeated. (Refer to “FLD Auto Test Operation” on page 6-12)

3. HOW TO EXIT FROM THE TEST MODE

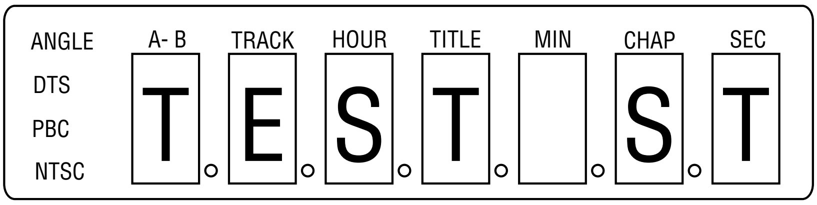
Press the POWER buttons on the set and Remocon, and the FL display tube turns off and the Standby mode is restored where only the red POWER LED lights up. This is the case where the SYSTEM CONTROL and IF CON are communicating normally. To forcibly activate the Standby mode, press the POWER button together with the STOP button.

FLD Auto Test Operation

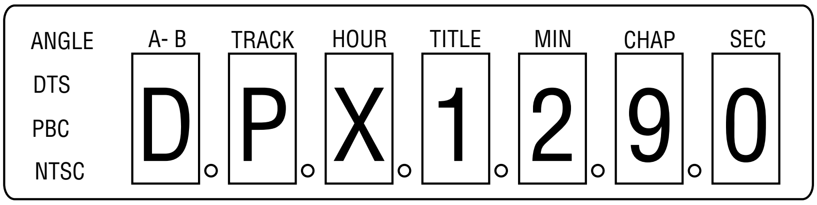
① FLD all light up (5 sec)


ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC

② TEST START display (2 sec) This is not displayed after second and subsequent tests.

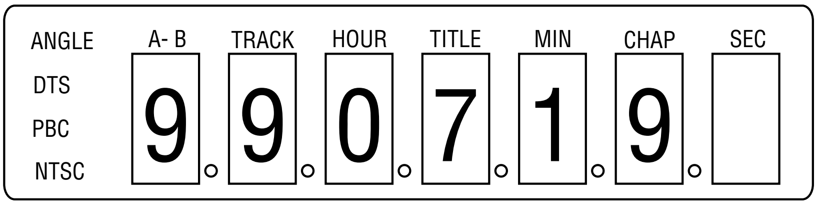

ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
T
E
S
T
S
T

③ Model display (2 sec)

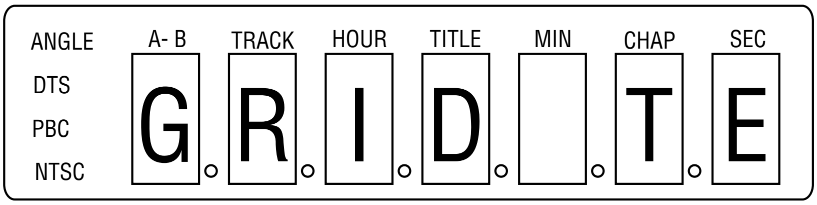

ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
D
P
X
1
2
9
0

Note: Prototypical model name of the series is displayed.

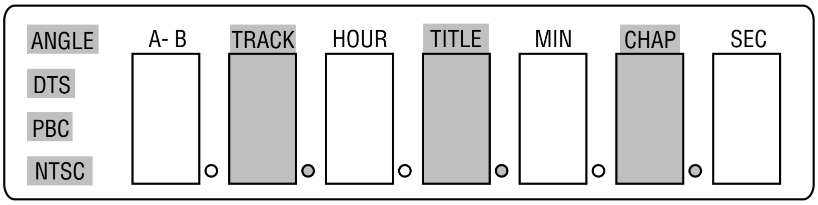
④ Date display (2 sec) Program updating date is displayed.


ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
9
9
0
7
1
9

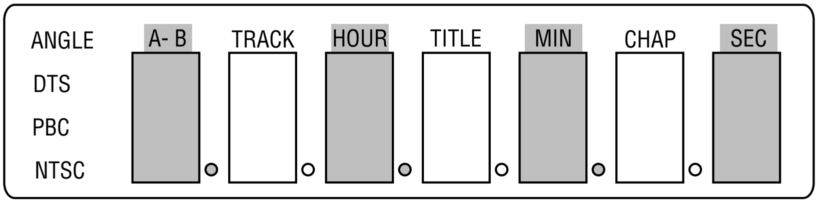
⑤ GRID TEST start display (1 sec)


ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
G
R
I
D
T
E

⑥ FLD odd grids light up (0.7 sec)

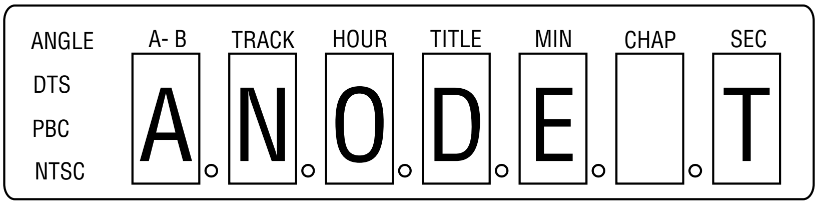

ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC

⑦ FLD even grids light up (0.7 sec)

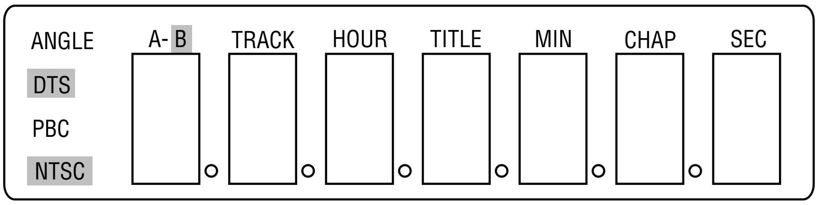

ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC

Note: Displays of ⑥ and ⑦ are repeated three times.

⑧ FLD ANODE TEST display No.1 (1 sec)

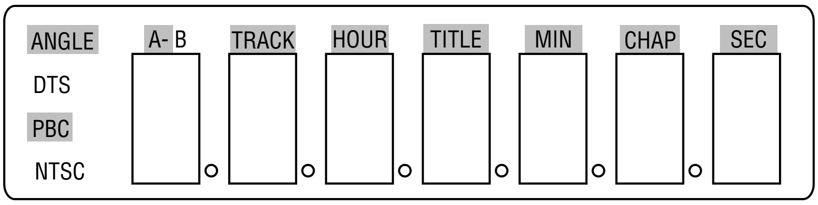

ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
A
N
O
D
E
T

⑨ FLD even anodes light up (0.7 sec)


ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC

Note: Also, even anodes of alphanumeric section light up.

⑩ FLD odd anodes light up (0.7 sec)


ANGLE
DTS
PBC
NTSC
A- B
TRACK
HOUR
TITLE
MIN
CHAP
SEC

Note: Also, odd anodes of alphanumeric section light up.
Note: Displays of ⑨ and ⑩ are repeated three times.

Hence, the operations of ① through ⑩ arerepeated.
However, ② is not displayed after the second and subsequent tests.

4. DESCRIPTION OF IF CON FUNCTION CHECK MODE

1. Button Function

In the Test mode, press any button (except POWER button) on the set. This operation terminates the automatic display test mode of the FL display tube. During the time that the button is pressed, the function name of the pressed button is displayed on the FL display tube, and “NOTHING” is displayed if releasing the button. For the button names displayed, refer to the following table.
For the illuminated button (LED built in), it turns on and off alternately each time it is pressed. For the multi-channel LED (blue LED), it blinks when the “RETURN” button is pressed because its dedicated button is not provided.

	Input Voltage [V]	IC601: Pin No. (Signal)
		Pin ⑥ (AN0)
1	0	POWER
2	0.65	OPEN/CLOSE
3	1.24	PLAY
4	1.88	STOP
5	2.41	PAUSE

The direction buttons are used to enter special modes.

↑ : FL display tube grid check
↓ : LED check
← : Direct search dial check
→ : FL display tube anode check

The buttons are all checked with the voltage at the A/D port. The reference voltage of A/D port is ever 5V. The voltage is calculated at 10bit accuracy and evaluated whether same voltage can be obtained in two-time operations to eliminate the chattering.
For the button check by the IF CON, a dead zone is provided, and if voltage in the dead zone is entered, “IGNORE” is displayed.

2. Remocon Receiving Function

Upon reception of a code from the Remocon when “NOTHING” is displayed, the function name of Remocon code is displayed on the FL display tube. The codes that can be received are DVD category codes only. The “DISPLAY” on Remocon functions to change over the function name display and the code display. In the code display mode, “REM NO xx” is displayed. A xx part is the received code in Hex notation. It is FF when a Remocon code is not received.

3. SYSTEM CONTROL-IF CON Serial Communication

Normally, two-way communication at 24ms interval is made between IF CON and SYSTEM CONTROL. Whether this communication is carried out normally can be checked easily. When “NOTHING” is displayed, OFF display of “ANGLE”, “DTS”, “PBC”, and “NTSC” characters on the left side of FL display tube indicates that a serial communication with the SYSTEM CONTROL is carried out normally. ON display of these characters indicates that the communication with the SYSTEM CONTROL is not made.
However, the communication is not made for several seconds after the Test mode became active (until MB-85 board is initialized), and these characters may turn on. This status is normal.

4. Direct Search Dial

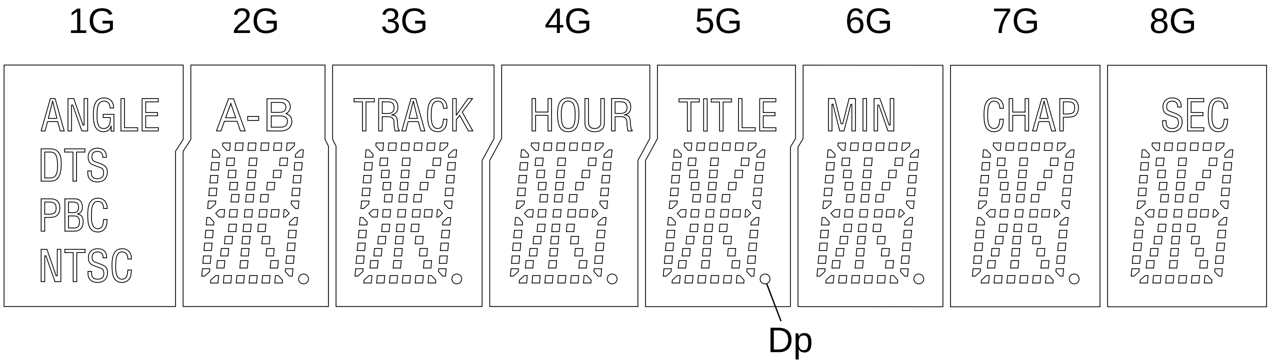
The grid X part displays images that rotate. At the same time, the numbers on music calendar shift toward the direction in which the direct search dial was rotated.
(Though this is displayed on the models which do not have the dial, it does not function because of no dial.)

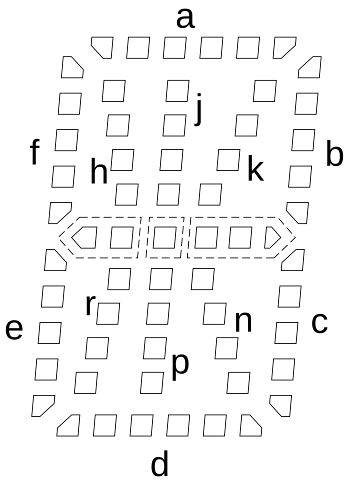
5. Click Shuttle

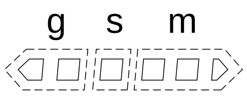
Whether the IF CON can judge the rotation of click shuttle is checked.In the following grid check and anode check, if the part that lights up is shifted as the click shuttle rotates, the function is normal.

6. Display of Fluorescent Display Tube

Use this mode when checking the FL display tube precisely, though the FL display tube is roughly checked in the auto display mode. Press simultaneously the STOP and PLAY buttons on the set, so that the FL display tube can all be lighted up.


1G
2G
3G
4G
5G
6G
7G
8G
ANGLE
DTS
PBC
NTSC
A-B
TRACK
HOUR
TITLE
MIN
CHAP
SEC
Dp


a
j
f
b
h
k
r
e
n
c
p
d



(2G~8G)

(Grid)

(Anode)

	1G	2G	3G	4G	5G	6G	7G	8G
P1	ANGLE	a	a	a	a	a	a	a
P2	DTS	h	h	h	h	h	h	h
P3	PBC	j	j	j	j	j	j	j
P4	NTSC	k	k	k	k	k	k	k
P5		b	b	b	b	b	b	b
P6		f	f	f	f	f	f	f
P7		m	m	m	m	m	m	m
P8		s	s	s	s	s	s	s
P9		g	g	g	g	g	g	g
P10		c	c	c	c	c	c	c
P11		e	e	e	e	e	e	e
P12		n	n	n	n	n	n	n
P13		p	p	p	p	p	p	p
P14		r	r	r	r	r	r	r
P15		d	d	d	d	d	d	d
P16		Dp	Dp	Dp	Dp	Dp	Dp	
P17		A-	TRACK	HOUR	TITLE	MIN	CHAP	SEC
P18		B						

7. Grid Check ($\boxed{\uparrow}$ button: Grid Check Mode)

In this mode, arbitrary one grid of FL display tube lights up. (The anodes of the grid concerned all light up.) To shift the grids, use the click shuttle on the set. For the models not having the click shuttle, the DVD Remocon having the click shuttle can be used instead.

During this mode, any one grid always lights up.

8. Anode Check ($\boxed{\rightarrow}$ button: Anode Check Mode)

In this mode, arbitrary one anode of FL display tube lights up. (All grids of the anode concerned all light up.)
Staring from P1, rotate the click shuttle clockwise, and the anodes shift such as P2, P3 .... The anodes return to P1 following the last anode. During this mode, one anode of all grids always lights up. For the models not having the click shuttle, the DVD Remocon having the click shuttle can be used instead.

9. LED Control

In this mode, LEDs, one by one, light up by pressing the $\boxed{\downarrow}$ button. The “CD”, “VIDEO CD” and “DVD” LEDs on the set can be controlled with the $\boxed{\text{STOP}}$ button.
Each time the $\boxed{\text{STOP}}$ button is pressed, CD → VIDEO CD → DVD → CD, VIDEO CD, DVD light up → CD, VIDEO CD, DVD go off are repeated.

5. TROUBLESHOOTING

1. Test Mode is not activated

With the set assembled in the front panel, the Test mode does not become active if any button was pressed by any reason.Under this condition, the power is not turned on even in the normal status. (The set is kept in Standby status = Red LED is kept on) Not only the buttons are inactive, but also a signal from Remocon is not accepted. To check this condition, with the self check port (pin (69) of IF CON) kept in “Low” status, supply the AC power, so that the Test mode is forcibly activated. On the board, short the lands where SELF is printed. The IF CON checks the self check port only after the power on reset (only when AC is supplied; not in Standby status). If any button was pressed, the button name should be displayed on the FL display tube. Though no button is pressed this time, display of other than NOTHING implies that the button was pressed. However, the set will go in Standby status immediately unless the FFC (pin ⑰) connected to the MB-85 board is disconnected in advance.

2. Power is not turned on

① Red (STANDBY) LED does not light up when AC was supplied. The power (EVER 5 V) is not supplied.
X201 is oscillating.
Loose connection of the connector between FL board and FR board.

② Red (STANDBY) LED is kept on though POWER button was pressed. Any button is kept pressed.
PCHECK (IF CON pin (77)) is over 0.1 V.

③ Green LED lights up when POWER button was pressed, but red LED lights up again after several seconds. PCHECK (IF CON pin (77)) is abnormal. (Slow rise time from 0.1 V to 1.5 V. Voltage must be less than 1.5 V)
SYSTEM CONTROL does not operate normally.

SECTION 7
ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-3. Adjustment Related Parts Arrangement.

Note: During diagnostic check, the characters and color bars can be seen only with the NTSC monitor. Therefore, for diagnostic check, use the monitor that supports both NTSC and PAL modes.
Use the reference disc for PAL for check, and use the reference disc for NTSC for adjustment.

This section describes procedures and instructions necessary for adjusting electrical circuits in this set.

Instruments required:

1) Color monitor TV
2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
3) Frequency counter (over 8 digits)
4) Digital voltmeter
5) Standard commander (RMT-D109E/D109O)
6) DVD reference disc
   HLX-501 (J-6090-071-A) (dual layer) (NTSC)
   HLX-503 (J-6090-069-A) (single layer) (NTSC)
   HLX-504 (J-6090-088-A) (single layer) (NTSC)
   HLX-505 (J-6090-089-A) (dual layer) (NTSC)
   HLX-506 (J-6090-077-A) (single layer) (PAL)
   HLX-507 (J-6090-078-A)(dual layer) (PAL)
7) SACD reference disc
   HLXA-509 (J-6090-090-A)

7-1. POWER SUPPLY ADJUSTMENT

1. MPD0102 Board

Mode	E-E
Instrument	Digital voltmeter
+5 V Check	
Test point	CN201 pin ⑤
Specification	5.0 ± 0.2 Vdc
+3.3 V Check	
Test point	CN201 pin ⑦
Specification	3.3 ± 0.2 Vdc
EVER+5 V Check	
Test point	CN203 pin ②
Specification	5.0 ± 0.2 Vdc
P_CONT Check	
Test point	CN203 pin ①
Specification	4V – 5 Vdc
+10 V Check	
Test point	CN201 pin ①
Specification	$9.5^{+1.5}_{-0.5}$ Vdc
–10 V Check	
Test point	CN203 pin ④
Specification	–10.0 ± 1.0 Vdc

Checking method:

1) Confirm that each voltage satisfies the specification.

7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-85 BOARD)

<Purpose>

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV401
Specification	1.0 ± 0.02 Vp-p

Adjusting method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Adjust the RV401 to attain 1.0 ± 0.02 Vp-p.

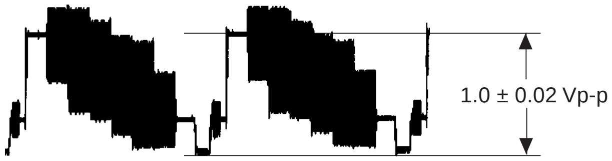


Figure 7-1

2. S-terminal Output Check (MB-85 BOARD)

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-Y level is 1.0 ± 0.1 Vp-p.

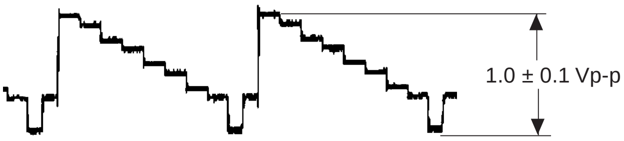


Figure 7-2

3. Checking S Video Output S-C (MB-85 BOARD)

<Purpose>

This checks whether the S-C satisfies the NTSC Standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	286 ± 50 mVp-p (NTSC) 300 ± 100 mVp-p (PAL)

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-C burst is 300 ± 100 mVp-p.

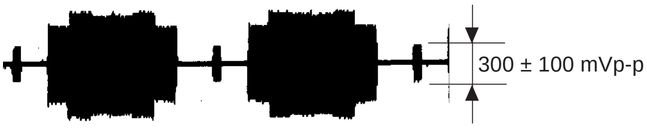
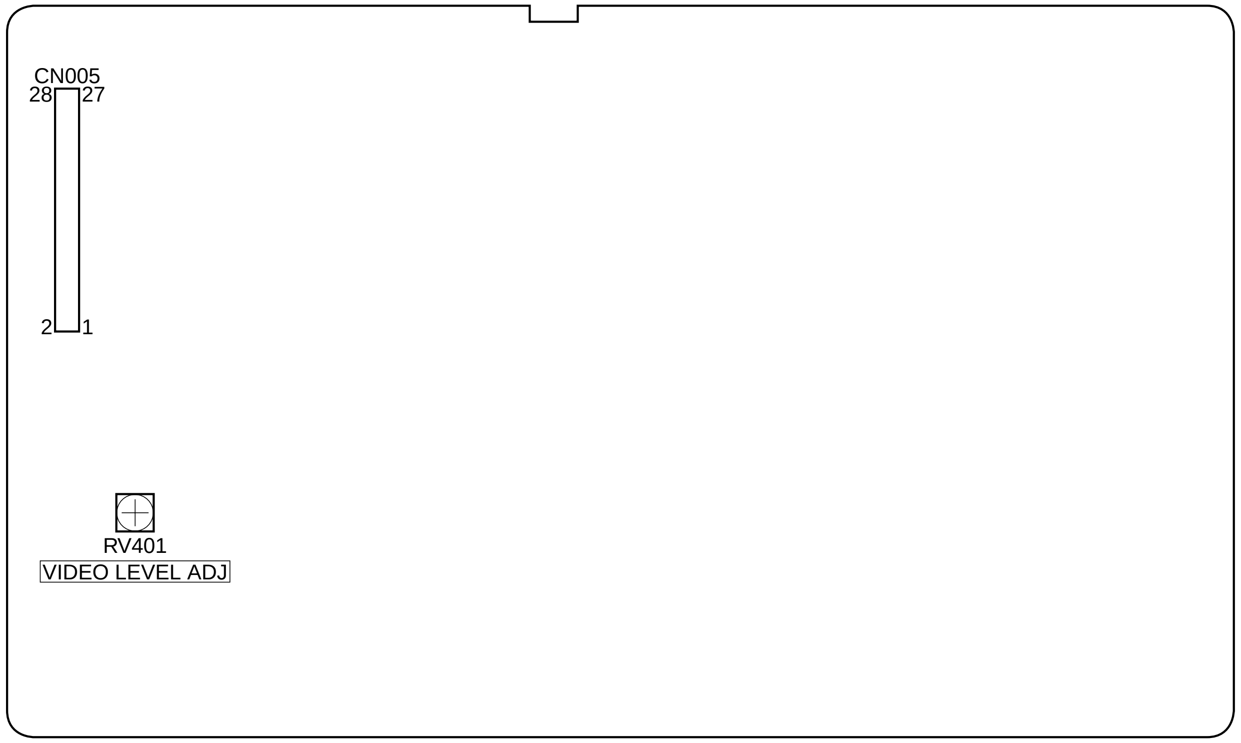


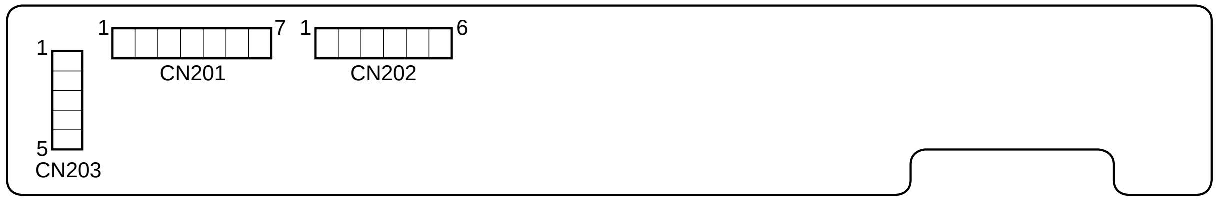
Figure 7-3

7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

MB-85 BOARD (SIDE A)


CN005
28
27
2
1
RV401
VIDEO LEVEL ADJ

MPD0102 BOARD (SIDE A)


1
7
CN201
1
6
CN202
1
5
CN203

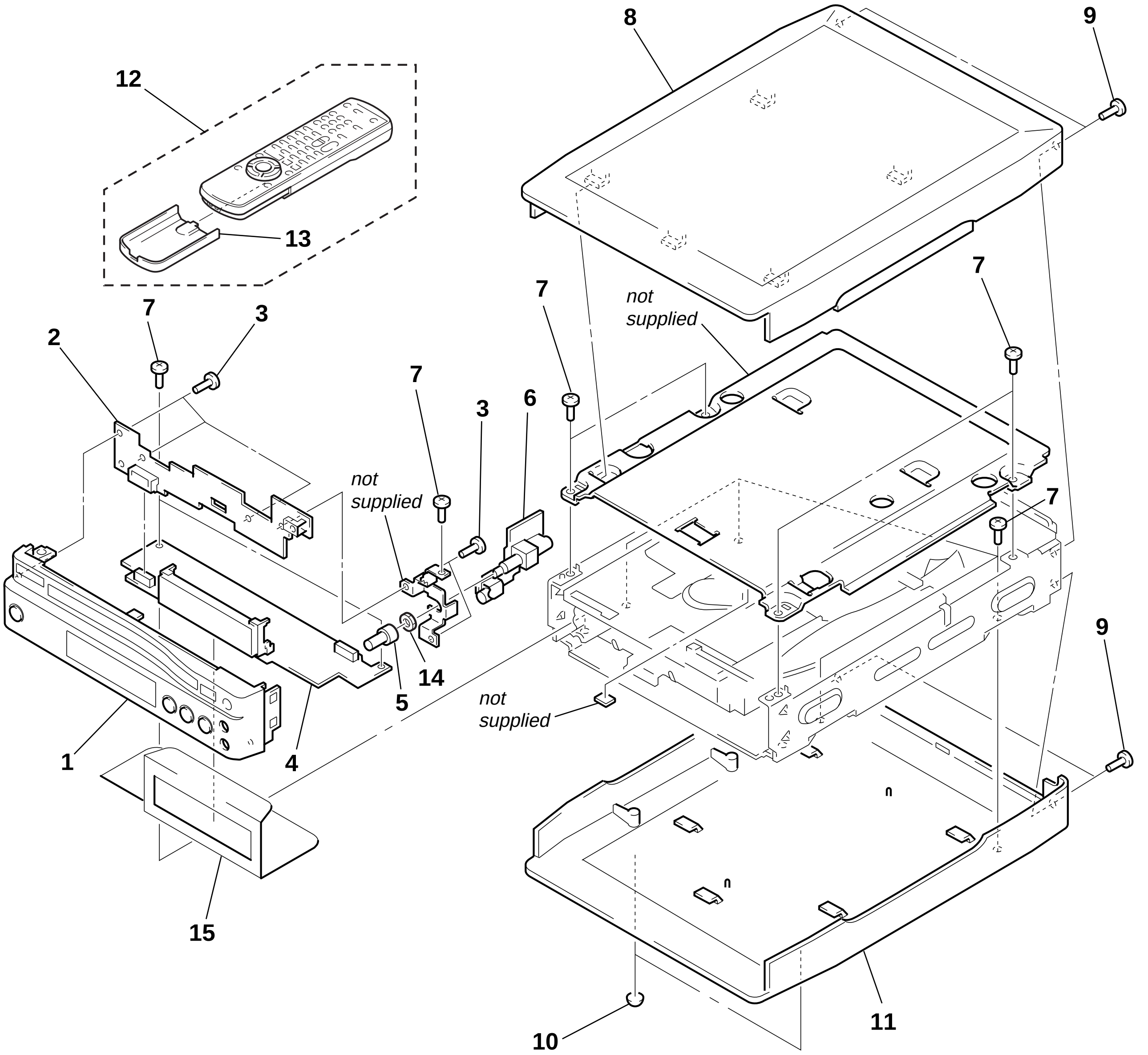
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  AUS : Australian model
  CN : Chinese model
  HK : Hong Kong model
  SP : Singapore model
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

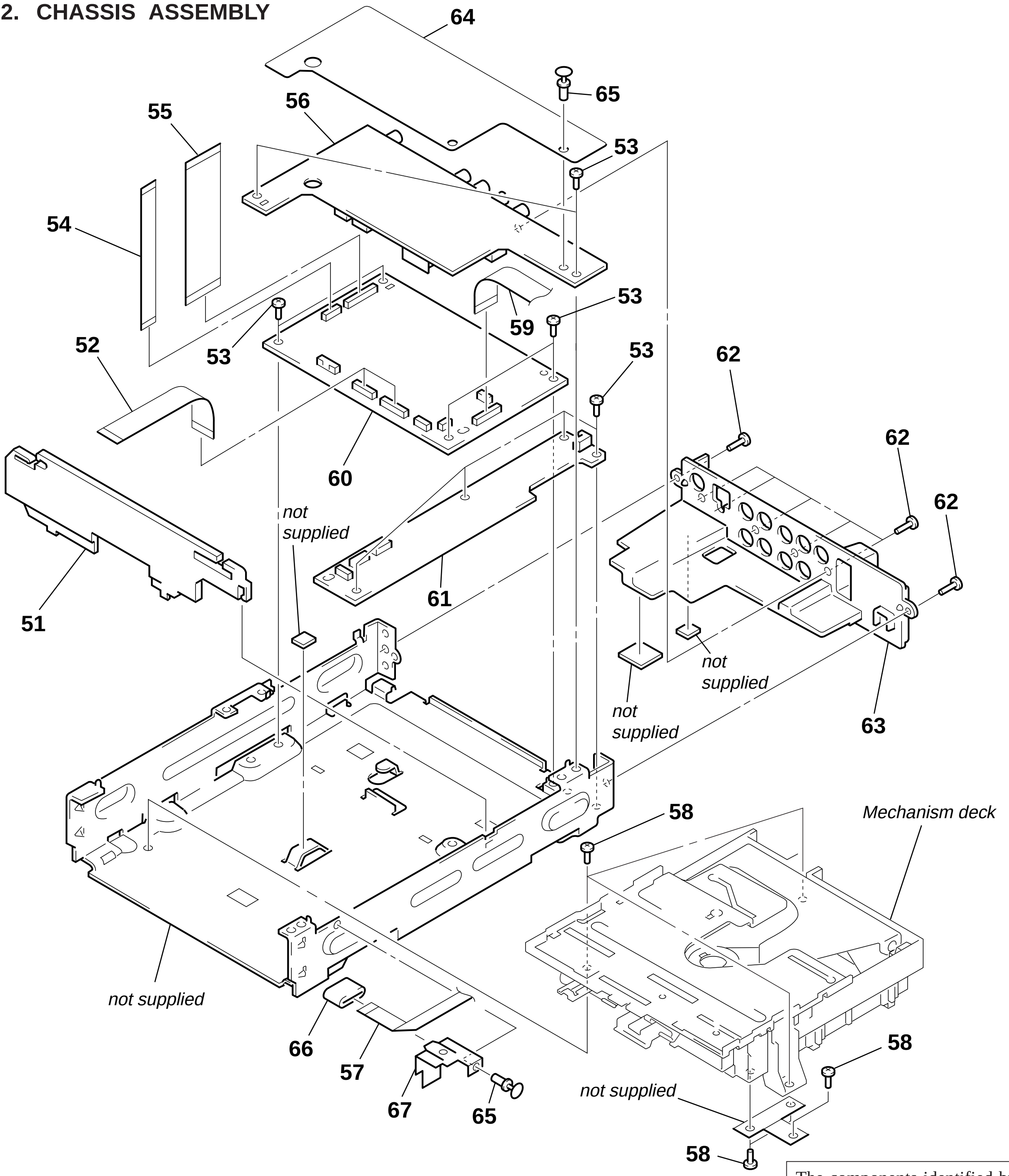
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-1-1. CASE AND FRONT PANEL ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3949-958-4	PANEL ASSY, FRONT	
* 2	A-6065-378-A	FR-166 BOARD, COMPLETE	
3	3-979-433-11	SCREW (+P2.6), TAPPING	
* 4	A-6065-377-A	FL-111 BOARD, COMPLETE	
5	3-057-522-01	KNOB, HP VOLUME	
* 6	A-6065-379-A	HP-122 BOARD, COMPLETE	
7	3-970-608-01	SUMITITE (B3), +BV	
8	3-057-500-01	CASE (UPPER) (EXCEPT HK, SP, CN)	
8	3-057-500-12	CASE (UPPER) (HK, SP, CN)	
9	3-970-608-51	SUMITITE (B3), +BV	
10	3-055-791-01	SUMITITE (B3) (RING), +BV	
11	X-3950-084-2	CASE (LOWER) ASSY	
12	1-418-508-21	COMMANDER, STANDARD (RMT-D109O/S)	(EXCEPT HK, SP, CN)
12	1-418-508-31	COMMANDER, STANDARD (RMT-D109E/S)	(HK, SP, CN)
13	3-053-633-01	COVER, BATTERY	(for RMT-D109O/S, D109E/S)
14	3-950-989-01	NUT (M7), HEXAGON	
15	X-3950-213-1	FILM ASSY, SHILD	

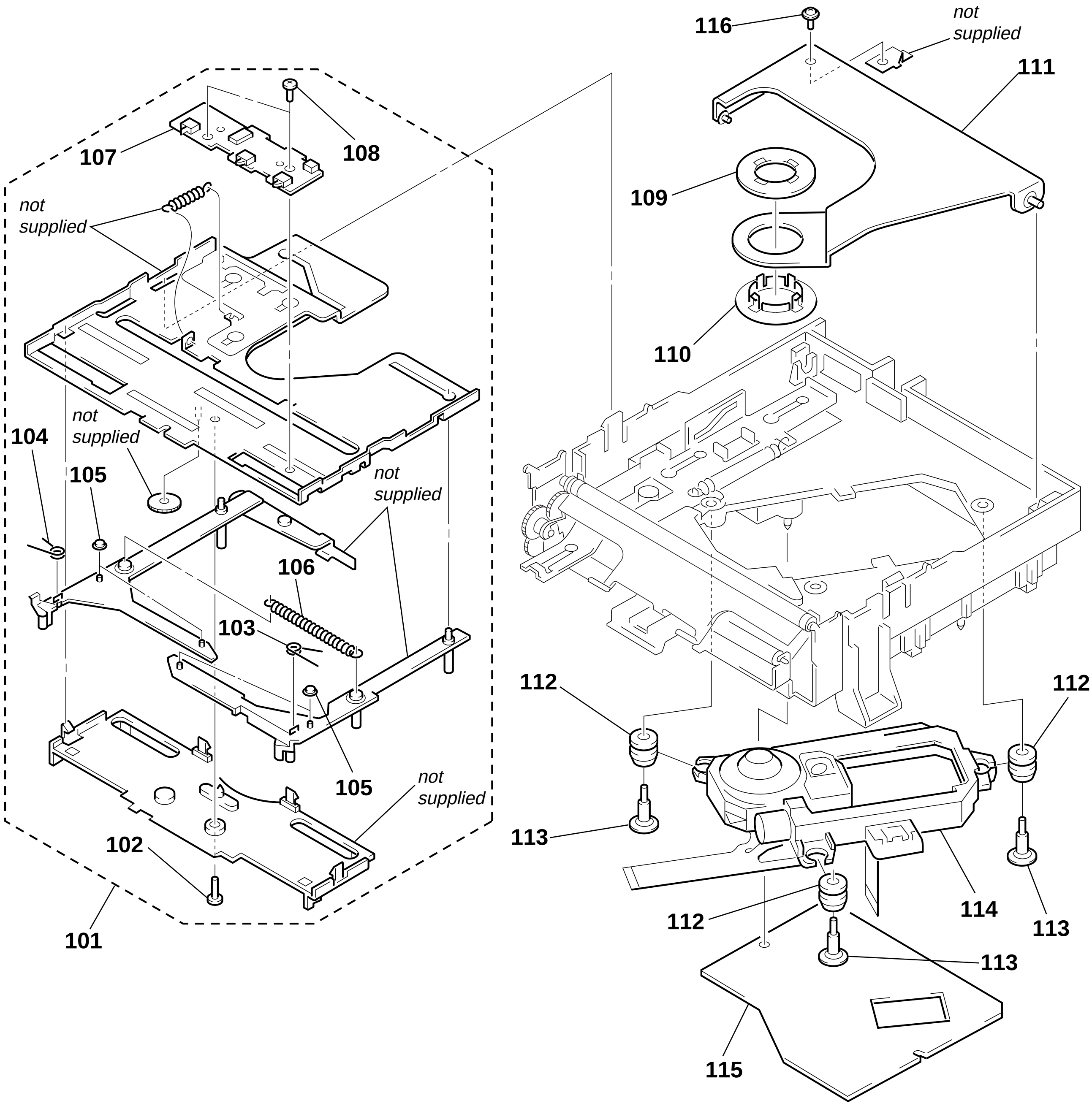
8-1-2. CHASSIS ASSEMBLY


64
65
55
56
53
54
59
53
52
53
53
60
62
62
62
not supplied
61
51
not supplied
not supplied
63
58
Mechanism deck
not supplied
66
57
67
65
58
not supplied
58

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	3-057-505-01	PLATE, HEAT INSULATING	
52	1-791-670-11	CABLE, FLEXIBLE FLAT (FMT-27)	
53	3-055-791-01	SUMITITE (B3) (RING), +BV	
54	1-791-668-11	CABLE, FLEXIBLE FLAT (FMA-17)	
55	1-791-669-11	CABLE, FLEXIBLE FLAT (FMA-18)	
* 56	A-6065-376-A	AU-222 BOARD, COMPLETE (EXCEPT HK, SP, AUS, CN)	
* 56	A-6065-383-A	AU-222 BOARD, COMPLETE (HK, SP, AUS, CN)	
57	1-791-672-11	CABLE, FLEXIBLE FLAT (FMS-12)	
58	3-970-608-01	SUMITITE (B3), +BV	
59	1-791-671-11	CABLE, FLEXIBLE FLAT (FMF-38)	
* 60	A-6065-375-A	MB-85 BOARD, COMPLETE (CED, UK)	
* 60	A-6065-384-A	MB-85 BOARD, COMPLETE (HK, SP)	
* 60	A-6065-385-A	MB-85 BOARD, COMPLETE (AUS)	
* 60	A-6065-390-A	MB-85 BOARD, COMPLETE (E32)	
* 60	A-6065-414-A	MB-85 BOARD, COMPLETE (CN)	
⚠61	1-418-669-11	CONVERTER UNIT, DC-DC	
62	3-970-608-51	SUMITITE (B3), +BV	
63	3-057-504-01	PANEL, REAR	
64	3-058-362-01	COVER, AU	
65	3-531-576-01	RIVET	
66	1-543-950-11	CORE, FERRITE	
67	3-058-026-01	HOLDER (SW)	

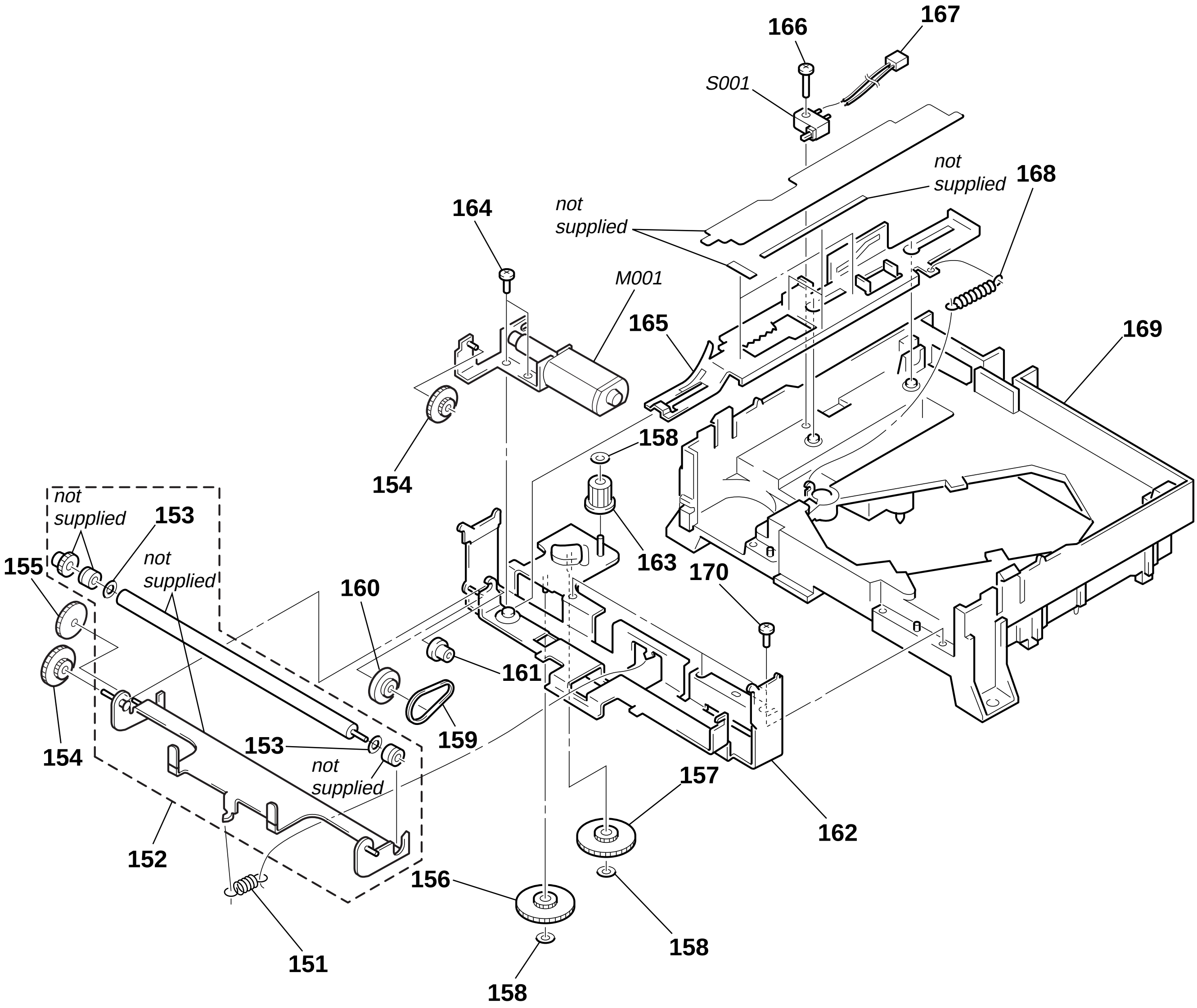
8-1-3. MECHANISM DECK ASSEMBLY-1


116
not supplied
111
107
108
not supplied
109
110
104
not supplied
105
not supplied
106
103
112
112
105
not supplied
113
102
112
114
113
113
101
115

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	A-6062-251-A	CHASSIS (TOP) BLOCK ASSY	
102	4-981-286-01	SCREW (M1.7X2) (IB LOCK)	
103	4-989-134-01	SPRING (R), TORSION	
104	4-989-135-01	SPRING (L), TORSION	
105	4-989-987-01	BEARING (SLIDE)	
106	3-059-234-01	SPRING (CENTERING), COIL	
107	X-3950-387-1	LEVER (CENTERING R) ASSY	
108	3-932-755-01	SCREW (M1.7X2.2)	
109	3-057-574-01	PLATE, YOKE	
110	3-057-573-01	PLATE, CHUCK	
111	X-3950-204-1	ARM ASSY, CHUCKING	
112	3-057-023-01	INSULATOR (RB)	
113	3-057-582-01	SCREW, INSULATOR	
⚠114	8-820-081-09	OPTICAL PICK-UP KHM-220AAA/J1RP	
* 115	A-6065-381-A	TK-55 BOARD, COMPLETE	
116	7-621-759-45	PSW, 2.6X6	

8-1-4. MECHANISM DECK ASSEMBLY-2


166
167
S001
not supplied
168
164
not supplied
M001
165
169
158
154
not supplied
153
155
not supplied
160
163
170
161
159
154
153
not supplied
157
162
152
156
158
151
158

Ref. No.	Part No.	Description	Remark
151	4-989-170-01	SPRING (ROLLER), TENSION	
152	A-6062-261-A	ARM BLOCK ASSY, ROLLER	
153	4-991-241-01	WASHER	
154	4-989-163-01	GEAR (ROLLER A)	
155	4-989-169-03	GEAR (ROLLER B)	
156	4-989-162-01	WHEEL (LD), WORM	
157	4-989-164-02	GEAR (LD A)	
158	3-377-719-11	WASHER, POLYETHYLENE	
159	4-989-186-01	BELT, ROLLER	
160	4-989-185-02	PULLEY, ROLLER	
161	4-989-184-02	PULLEY, MOTOR	
162	X-3949-966-1	CHASSIS (FRONT) ASSY	
163	3-060-386-01	GEAR (LD B)	
164	3-317-552-71	SCREW (M1.7)	
165	3-057-568-01	SLIDER, CAM	
166	4-993-986-01	SCREW (2) (P TITE), (+) P TAPPING	
167	1-960-020-11	HARNESS (ST-117)	
168	4-989-188-01	SPRING (CAM SLIDER), TENSION	
169	X-3949-967-1	FRAME ASSY, MAIN	
170	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
M001	A-6062-252-A	MOTOR ASSY, LD (LOADING)	
S001	1-570-771-21	SWITCH (CHUCK SENSOR)	

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Abbreviation
  AUS : Australian model
  CN : Chinese model
  HK : Hong Kong model
  SP : Singapore model
- Items marked "*" are not stocked since they are seldom required for routine service.
  Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA. . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. .
  uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH
- Not all of the parts for DC-DC CONVERTER UNIT (MPD0102) are listed.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6065-376-A	AU-222 BOARD, COMPLETE (EXCEPT HK, SP, AUS, CN)			
*	A-6065-383-A	AU-222 BOARD, COMPLETE (HK, SP, AUS, CN)			
		************************ (Ref.No. 2,000 Series)			
		< CAPACITOR >			
C301	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C302	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C304	1-126-926-11	ELECT	1000uF	20%	10V
C305	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C306	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C307	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C308	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C312	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C313	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C314	1-104-665-11	ELECT	100uF	20%	10V
C315	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C316	1-104-665-11	ELECT	100uF	20%	10V
C317	1-104-664-11	ELECT	47uF	20%	16V
C318	1-104-664-11	ELECT	47uF	20%	16V
C319	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C320	1-104-664-11	ELECT	47uF	20%	16V
C321	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C322	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C323	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C324	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C325	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C326	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C327	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C328	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C329	1-130-491-00	MYLAR	0.047uF	5%	50V
C330	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C331	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C332	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C334	1-136-170-00	MYLAR	0.27uF	5%	50V
C335	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C336	1-104-664-11	ELECT	47uF	20%	16V
C337	1-136-850-11	MYLAR	0.1uF	5%	63V
C338	1-104-664-11	ELECT	47uF	20%	16V
C339	1-104-664-11	ELECT	47uF	20%	16V
C340	1-136-850-11	MYLAR	0.1uF	5%	63V
C341	1-104-664-11	ELECT	47uF	20%	16V
C342	1-104-665-11	ELECT	100uF	20%	10V
C345	1-104-665-11	ELECT	100uF	20%	10V
C346	1-104-665-11	ELECT	100uF	20%	10V
C347	1-104-665-11	ELECT	100uF	20%	10V
C348	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C350	1-126-935-11	ELECT	470uF	20%	6.3V
C351	1-126-935-11	ELECT	470uF	20%	6.3V
C352	1-104-664-11	ELECT	47uF	20%	16V
C353	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C355	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C356	1-126-960-11	ELECT	1uF	20%	50V
C357	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS, CN)
C357	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS, CN)
C358	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS, CN)
C358	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS, CN)
C359	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS, CN)
C359	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS, CN)
C360	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS, CN)
C360	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS, CN)
C361	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C362	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C365	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C366	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C367	1-164-346-11	CERAMIC CHIP	1uF		16V
C368	1-164-346-11	CERAMIC CHIP	1uF		16V
C369	1-164-346-11	CERAMIC CHIP	1uF		16V
C371	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C372	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C373	1-104-664-11	ELECT	47uF	20%	16V
		< CONNECTOR >			
CN301	1-785-698-11	CONNECTOR, FFC/FPC 28P			
CN302	1-785-695-11	CONNECTOR, FFC/FPC 13P			
CN303	1-573-733-11	PIN, CONNECTOR 6P			
CN306	1-506-482-11	PIN, CONNECTOR 3P			

AU-222

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D301	8-719-988-61	DIODE 1SS355TE-17	
D302	8-719-988-61	DIODE 1SS355TE-17	
D304	8-719-988-61	DIODE 1SS355TE-17	
D305	8-719-988-61	DIODE 1SS355TE-17	
D306	8-719-988-61	DIODE 1SS355TE-17	
D308	8-719-071-15	DIODE HZM6.8ZWA1TL	
D309	8-719-071-15	DIODE HZM6.8ZWA1TL	
D310	8-719-071-15	DIODE HZM6.8ZWA1TL	
D311	8-719-071-15	DIODE HZM6.8ZWA1TL	
		< FERRITE BEAD >	
FB301	1-414-553-11	FERRITE 0uH	
FB302	1-414-553-11	FERRITE 0uH	
FB303	1-414-553-11	FERRITE 0uH	
FB304	1-414-553-11	FERRITE 0uH	
FB305	1-414-135-11	FERRITE 0uH	
FB306	1-414-553-11	FERRITE 0uH	
FB307	1-414-553-11	FERRITE 0uH	
FB308	1-414-553-11	FERRITE 0uH	
FB309	1-414-553-11	FERRITE 0uH	
FB310	1-414-553-11	FERRITE 0uH	
FB311	1-414-553-11	FERRITE 0uH	
FB312	1-414-553-11	FERRITE 0uH	
FB313	1-414-553-11	FERRITE 0uH	
FB314	1-414-553-11	FERRITE 0uH	
FB315	1-414-553-11	FERRITE 0uH	
FB316	1-414-553-11	FERRITE 0uH	
FB317	1-414-553-11	FERRITE 0uH	
FB318	1-414-553-11	FERRITE 0uH	
FB319	1-414-553-11	FERRITE 0uH	
FB320	1-414-553-11	FERRITE 0uH	
		< IC >	
IC301	8-759-288-53	IC LA5617	
IC303	8-759-909-71	IC BA4558F-E2	
IC304	8-759-909-71	IC BA4558F-E2	
IC305	8-759-909-71	IC BA4558F-E2	
IC306	8-759-525-25	IC BU4052BCF-E2	
IC307	8-759-909-71	IC BA4558F-E2	
IC308	8-759-563-79	IC BA7660F-E2	
IC309	8-749-016-00	IC HVE0024 (OPTICAL)	
IC310	8-759-242-64	IC TC4W53F (TE12R)	
		< JACK >	
J301	1-793-446-21	JACK, PIN 1P (COAXIAL)	
J302	1-694-409-41	TERMINAL BOARD (LINE OUT)	
J303	1-793-446-11	JACK, PIN 1P (WOOFER OUT)	
		< COIL >	
L301	1-412-953-11	INDUCTOR 15uH	
L302	1-412-953-11	INDUCTOR 15uH	
L303	1-412-953-11	INDUCTOR 15uH	
L304	1-412-963-11	INDUCTOR 100uH	
		< TRANSISTOR >	
Q301	8-729-421-19	TRANSISTOR UN2213-TX	
Q302	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
Q303	8-729-421-19	TRANSISTOR UN2213-TX	
Q304	8-729-424-08	TRANSISTOR UN2111-TX	
Q305	8-729-424-08	TRANSISTOR UN2111-TX	
Q306	8-729-424-08	TRANSISTOR UN2111-TX	
Q307	8-729-424-08	TRANSISTOR UN2111-TX	
Q311	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q314	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q317	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q318	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q319	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q320	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q321	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q322	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q323	8-729-421-19	TRANSISTOR UN2213-TX	
Q324	8-729-424-08	TRANSISTOR UN2111-TX	
Q325	8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR	
Q326	8-729-421-19	TRANSISTOR UN2213-TX	
Q327	8-729-421-19	TRANSISTOR UN2213-TX	
Q330	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS, CN)
Q331	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS, CN)
Q332	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS, CN)
Q333	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS, CN)
		< RESISTOR >	
R302	1-216-042-00	METAL CHIP 510 5%	1/10W
R303	1-216-042-00	METAL CHIP 510 5%	1/10W
R304	1-216-042-00	METAL CHIP 510 5%	1/10W
R307	1-216-073-00	METAL CHIP 10K 5%	1/10W
R310	1-216-073-00	METAL CHIP 10K 5%	1/10W
R312	1-216-081-00	METAL CHIP 22K 5%	1/10W
R313	1-216-109-00	METAL CHIP 330K 5%	1/10W
R318	1-216-049-91	RES, CHIP 1K 5%	1/10W
R319	1-216-097-91	RES, CHIP 100K 5%	1/10W
R321	1-216-097-91	RES, CHIP 100K 5%	1/10W
R324	1-216-097-91	RES, CHIP 100K 5%	1/10W
R325	1-216-097-91	RES, CHIP 100K 5%	1/10W
R326	1-216-097-91	RES, CHIP 100K 5%	1/10W
R328	1-216-089-91	RES, CHIP 47K 5%	1/10W
R329	1-216-089-91	RES, CHIP 47K 5%	1/10W
R331	1-216-089-91	RES, CHIP 47K 5%	1/10W
R332	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R333	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R334	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R335	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R336	1-216-077-91	RES, CHIP 15K 5%	1/10W
R337	1-216-077-91	RES, CHIP 15K 5%	1/10W
R338	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R339	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R340	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R341	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R342	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R343	1-216-079-00	METAL CHIP 18K 5%	1/10W
R344	1-216-295-91	SHORT 0	
R346	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R347	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R348	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R349	1-216-295-91	SHORT 0	
R350	1-216-009-91	RES, CHIP 22 5%	1/10W
R351	1-216-009-91	RES, CHIP 22 5%	1/10W

Ref. No.	Part No.	Description			Remark
R352	1-216-009-91	RES, CHIP	22	5%	1/10W
R353	1-216-041-00	METAL CHIP	470	5%	1/10W
R354	1-216-295-91	SHORT	0		
R355	1-216-295-91	SHORT	0		
R356	1-216-115-00	METAL CHIP	560K	5%	1/10W
R357	1-216-115-00	METAL CHIP	560K	5%	1/10W
R358	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R359	1-216-047-91	RES, CHIP	820	5%	1/10W
R360	1-216-095-00	METAL CHIP	82K	5%	1/10W
R362	1-216-047-91	RES, CHIP	820	5%	1/10W
R366	1-216-049-91	RES, CHIP	1K	5%	1/10W
R367	1-216-049-91	RES, CHIP	1K	5%	1/10W
R370	1-216-109-00	METAL CHIP	330K	5%	1/10W
R371	1-216-109-00	METAL CHIP	330K	5%	1/10W
R372	1-216-109-00	METAL CHIP	330K	5%	1/10W
R373	1-216-073-00	METAL CHIP	10K	5%	1/10W
R374	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R375	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R376	1-216-075-00	METAL CHIP	12K	5%	1/10W
R378	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R379	1-216-041-00	METAL CHIP	470	5%	1/10W
R380	1-216-075-00	METAL CHIP	12K	5%	1/10W
R381	1-216-073-00	METAL CHIP	10K	5%	1/10W
R382	1-216-041-00	METAL CHIP	470	5%	1/10W
R383	1-216-041-00	METAL CHIP	470	5%	1/10W
R384	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R387	1-216-049-91	RES, CHIP	1K	5%	1/10W
R388	1-216-049-91	RES, CHIP	1K	5%	1/10W
R390	1-216-049-91	RES, CHIP	1K	5%	1/10W
R391	1-216-049-91	RES, CHIP	1K	5%	1/10W
R392	1-216-025-91	RES, CHIP	100	5%	1/10W
R393	1-216-085-00	METAL CHIP	33K	5%	1/10W
R394	1-216-085-00	METAL CHIP	33K	5%	1/10W
R395	1-216-085-00	METAL CHIP	33K	5%	1/10W
R396	1-216-085-00	METAL CHIP	33K	5%	1/10W
R397	1-216-085-00	METAL CHIP	33K	5%	1/10W
R398	1-216-081-00	METAL CHIP	22K	5%	1/10W
R399	1-216-081-00	METAL CHIP	22K	5%	1/10W
R400	1-216-085-00	METAL CHIP	33K	5%	1/10W
R410	1-216-049-91	RES, CHIP	1K	5%	1/10W (EXCEPT HK, SP, AUS, CN)
R411	1-216-049-91	RES, CHIP	1K	5%	1/10W (EXCEPT HK, SP, AUS, CN)
R412	1-216-049-91	RES, CHIP	1K	5%	1/10W (EXCEPT HK, SP, AUS, CN)
R413	1-216-049-91	RES, CHIP	1K	5%	1/10W (EXCEPT HK, SP, AUS, CN)
R466	1-216-027-00	METAL CHIP	120	5%	1/10W
R467	1-216-027-00	METAL CHIP	120	5%	1/10W
R468	1-216-027-00	METAL CHIP	120	5%	1/10W
R469	1-216-027-00	METAL CHIP	120	5%	1/10W
R470	1-216-049-91	RES, CHIP	1K	5%	1/10W
R471	1-216-049-91	RES, CHIP	1K	5%	1/10W
R472	1-216-073-00	METAL CHIP	10K	5%	1/10W
R473	1-216-073-00	METAL CHIP	10K	5%	1/10W
R474	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R475	1-216-073-00	METAL CHIP	10K	5%	1/10W
R476	1-216-021-00	METAL CHIP	68	5%	1/10W
R477	1-216-021-00	METAL CHIP	68	5%	1/10W
R478	1-216-021-00	METAL CHIP	68	5%	1/10W
R479	1-216-021-00	METAL CHIP	68	5%	1/10W
R480	1-216-021-00	METAL CHIP	68	5%	1/10W
R481	1-216-021-00	METAL CHIP	68	5%	1/10W
R482	1-216-063-91	RES, CHIP	3.9K	5%	1/10W
R483	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R484	1-216-033-00	METAL CHIP	220	5%	1/10W
R485	1-216-021-00	METAL CHIP	68	5%	1/10W
R486	1-216-041-00	METAL CHIP	470	5%	1/10W
R487	1-216-041-00	METAL CHIP	470	5%	1/10W
R488	1-216-041-00	METAL CHIP	470	5%	1/10W
R489	1-216-041-00	METAL CHIP	470	5%	1/10W
R490	1-216-295-91	SHORT	0		
R491	1-216-025-91	RES, CHIP	100	5%	1/10W
R492	1-216-097-91	RES, CHIP	100K	5%	1/10W
R495	1-216-073-00	METAL CHIP	10K	5%	1/10W
R496	1-216-073-00	METAL CHIP	10K	5%	1/10W
R497	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

⚠ 1-418-669-11 DC-DC CONVERTER UNIT (MPD0102)
****
(Ref.No. 6,000 Series)

< DIODE >

D201	9-884-690-01	DIODE	ERB83-006		
D221	9-884-691-01	DIODE	1SS133		
D251	9-884-690-01	DIODE	ERB83-006		
D261	9-884-692-01	DIODE	2FWJ42N		
D262	9-884-693-01	DIODE	HZS12		
D272	9-884-694-01	DIODE	HZ22		
D292	9-884-695-01	DIODE	ERA15-006		

< IC >

IC251	9-884-696-01	IC	PQ05RD11		
IC271	9-884-697-01	IC	TA76431S		
IC281	9-884-698-01	IC	uPC78L05		

< TRANSISTOR >

Q201	9-884-699-01	TRANSISTOR	2SK2232		
Q202	9-884-700-01	TRANSISTOR	2SC1741AS		
Q221	9-884-701-01	TRANSISTOR	2SC1740S		
Q261	9-884-702-01	TRANSISTOR	2SA933S		
Q291	9-884-703-01	TRANSISTOR	2SJ378		
Q292	9-884-701-01	TRANSISTOR	2SC1740S		
Q293	9-884-701-01	TRANSISTOR	2SC1740S		
Q294	9-884-701-01	TRANSISTOR	2SC1740S		

< RESISTOR >

R265	9-884-704-01	CARBON	3.3K	0.5%	1/4W
R266	9-884-706-01	CARBON	10K	0.5%	1/4W
R281	9-884-705-01	CARBON	22		2W

< TRANSFORMER >

T201	9-884-707-01	TRANSFORMER			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

FL-111

Ref. No.	Part No.	Description			Remark
*	A-6065-377-A	FL-111 BOARD, COMPLETE			
		***********************			
					(Ref.No. 2,000 Series)
	3-057-521-01	HOLDER, FL			
		< CAPACITOR >			
C601	1-126-395-11	ELECT	22uF	20%	16V
C603	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C605	1-126-400-11	ELECT	22uF	20%	35V
C606	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C608	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C609	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C610	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C611	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C612	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C614	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C615	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C617	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C619	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C620	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C622	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C623	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C624	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C625	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C626	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C630	1-131-746-11	CERAMIC CHIP	0.0027uF	5%	100V
		< CONNECTOR >			
CN602	1-774-767-11	CONNECTOR, FFC/FPC 15P			
CN603	1-793-658-11	CONNECTOR BOARD TO BOARD 12P			
CN604	1-784-650-21	CONNECTOR 2P			
		< DIODE >			
D601	8-719-041-97	DIODE MA113- (TX)			
D602	8-719-041-97	DIODE MA113- (TX)			
D603	8-719-041-97	DIODE MA113- (TX)			
D604	8-719-041-97	DIODE MA113- (TX)			
D606	8-719-421-85	DIODE MA8043-H (TX)			
D607	8-719-988-61	DIODE 1SS355TE-17			
		< FERRITE BEAD >			
FB601	1-414-135-11	FERRITE	0uH		
FB602	1-414-135-11	FERRITE	0uH		
FB603	1-469-324-21	FERRITE	0uH		
		< IC >			
IC601	8-759-658-36	IC M38B57MCH-D233FP			
IC602	8-759-326-78	IC PST9140NL			
		< COIL >			
L601	1-412-031-11	INDUCTOR CHIP	47uH		
		< FLUORESCENT INDICATOR >			
ND601	1-517-918-11	INDICATOR TUBE, FLUORESCENT			
		< TRANSISTOR >			
Q604	8-729-808-01	TRANSISTOR	2SD1622-S-TD		
Q605	8-729-808-01	TRANSISTOR	2SD1622-S-TD		

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R603	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R604	1-216-073-00	METAL CHIP	10K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W
R607	1-216-073-00	METAL CHIP	10K	5%	1/10W
R610	1-216-027-00	RES, CHIP	120	5%	1/10W
R611	1-216-013-00	RES, CHIP	33	5%	1/10W
R612	1-216-073-00	METAL CHIP	10K	5%	1/10W
R613	1-216-073-00	METAL CHIP	10K	5%	1/10W
R614	1-216-073-00	METAL CHIP	10K	5%	1/10W
R615	1-216-073-00	METAL CHIP	10K	5%	1/10W
R616	1-216-073-00	METAL CHIP	10K	5%	1/10W
R617	1-216-025-91	RES, CHIP	100	5%	1/10W
R618	1-216-025-91	RES, CHIP	100	5%	1/10W
R619	1-216-025-91	RES, CHIP	100	5%	1/10W
R620	1-216-025-91	RES, CHIP	100	5%	1/10W
R621	1-216-025-91	RES, CHIP	100	5%	1/10W
R626	1-216-073-00	METAL CHIP	10K	5%	1/10W
R627	1-216-073-00	METAL CHIP	10K	5%	1/10W
R628	1-216-025-91	RES, CHIP	100	5%	1/10W
R629	1-216-049-91	RES, CHIP	1K	5%	1/10W
R630	1-216-025-91	RES, CHIP	100	5%	1/10W
R631	1-216-073-00	METAL CHIP	10K	5%	1/10W
R633	1-216-073-00	METAL CHIP	10K	5%	1/10W
R634	1-216-073-00	METAL CHIP	10K	5%	1/10W
R635	1-216-073-00	METAL CHIP	10K	5%	1/10W
R636	1-216-073-00	METAL CHIP	10K	5%	1/10W
R637	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R638	1-216-025-91	RES, CHIP	100	5%	1/10W
R639	1-216-097-91	RES, CHIP	100K	5%	1/10W
R640	1-216-073-00	METAL CHIP	10K	5%	1/10W
R641	1-216-073-00	METAL CHIP	10K	5%	1/10W
R642	1-216-073-00	METAL CHIP	10K	5%	1/10W
R643	1-216-073-00	METAL CHIP	10K	5%	1/10W
R645	1-216-073-00	METAL CHIP	10K	5%	1/10W
R646	1-216-073-00	METAL CHIP	10K	5%	1/10W
R647	1-216-073-00	METAL CHIP	10K	5%	1/10W
R648	1-216-025-91	RES, CHIP	100	5%	1/10W
R650	1-216-073-00	METAL CHIP	10K	5%	1/10W
R651	1-216-073-00	METAL CHIP	10K	5%	1/10W
R652	1-216-073-00	METAL CHIP	10K	5%	1/10W
R653	1-216-093-91	RES, CHIP	68K	5%	1/10W (CED)
R654	1-216-093-91	RES, CHIP	68K	5%	1/10W (CED)
R655	1-216-073-00	METAL CHIP	10K	5%	1/10W
R659	1-216-089-91	RES, CHIP	47K	5%	1/10W
R660	1-216-073-00	METAL CHIP	10K	5%	1/10W
R661	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R662	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R663	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R664	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R665	1-216-025-91	RES, CHIP	100	5%	1/10W
R666	1-216-025-91	RES, CHIP	100	5%	1/10W
R667	1-216-025-91	RES, CHIP	100	5%	1/10W
R668	1-216-025-91	RES, CHIP	100	5%	1/10W
R669	1-216-025-91	RES, CHIP	100	5%	1/10W

Ref. No.	Part No.	Description	Remark
R670	1-216-025-91	RES, CHIP 100 5%	1/10W
R671	1-216-025-91	RES, CHIP 100 5%	1/10W
R672	1-216-025-91	RES, CHIP 100 5%	1/10W
R673	1-216-025-91	RES, CHIP 100 5%	1/10W
R675	1-216-295-91	SHORT 0	
		< TRANSFORMER >	
T601	1-435-159-11	TRANSFORMER, DC-DC CONVERTER	
		< VIBRATOR >	
X601	1-767-359-11	VIBRATOR, CERAMIC (4MHz)	
*	A-6065-378-A	FR-166 BOARD, COMPLETE	
		************************	
		(Ref.No. 2,000 Series)	
		< CAPACITOR >	
C701	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C702	1-131-651-21	TANTALUM CHIP 10uF 20%	16V
		< CONNECTOR >	
CN701	1-784-987-11	CONNECTOR 12P	
		< DIODE >	
D701	8-719-064-11	DIODE SPR-325MVW (ON/STANDBY)	
D702	8-719-056-06	DIODE SLR-342DCT31 (DVD)	
D703	8-719-056-06	DIODE SLR-342DCT31 (VIDEO CD)	
D704	8-719-056-06	DIODE SLR-342DCT31 (CD)	
D705	8-719-056-06	DIODE SLR-342DCT31 (▯▯)	
D706	8-719-056-07	DIODE SLR-342MCT31 (▷)	
		< IC >	
IC701	8-749-011-22	IC GP1U27X	
		< COIL >	
L701	1-412-030-11	INDUCTOR CHIP 22uH	
		< RESISTOR >	
R701	1-216-073-00	METAL CHIP 10K 5%	1/10W
R702	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R703	1-216-065-91	RES, CHIP 4.7K 5%	1/10W
R704	1-216-075-00	METAL CHIP 12K 5%	1/10W
R705	1-216-089-91	RES, CHIP 47K 5%	1/10W
R706	1-216-025-91	RES, CHIP 100 5%	1/10W
R708	1-216-045-00	METAL CHIP 680 5%	1/10W
R709	1-216-033-00	METAL CHIP 220 5%	1/10W
R710	1-216-033-00	METAL CHIP 220 5%	1/10W
R711	1-216-033-00	METAL CHIP 220 5%	1/10W
R712	1-216-033-00	METAL CHIP 220 5%	1/10W
R713	1-216-033-00	METAL CHIP 220 5%	1/10W
R714	1-216-025-91	RES, CHIP 100 5%	1/10W
		< SWITCH >	
S701	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (I/⏻)	
S702	1-771-349-21	SWITCH, KEY BOARD (⏏)	
S703	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (▷)	
S704	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (□)	

Ref. No.	Part No.	Description	Remark
S705	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (▯▯)	
*	A-6065-379-A	HP-122 BOARD, COMPLETE	
		************************	
		(Ref.No. 2,000 Series)	
	3-057-577-01	PLATE, HP GROUND	
		< CAPACITOR >	
C501	1-163-017-00	CERAMIC CHIP 0.0047uF 10%	50V
C502	1-163-017-00	CERAMIC CHIP 0.0047uF 10%	50V
		< CONNECTOR >	
CN501	1-506-482-11	PIN, CONNECTOR 3P	
		< DIODE >	
D501	8-719-071-15	DIODE HZM6.8ZWA1TL	
D502	8-719-071-15	DIODE HZM6.8ZWA1TL	
		< FERRITE BEAD >	
FB501	1-414-135-11	FERRITE 0uH	
FB502	1-414-135-11	FERRITE 0uH	
FB503	1-414-135-11	FERRITE 0uH	
		< JACK >	
J501	1-573-798-11	JACK, MINIATURE (DIA. 3.5) (PHONES)	
		< RESISTOR >	
R501	1-216-017-91	RES, CHIP 47 5%	1/10W
R502	1-216-017-91	RES, CHIP 47 5%	1/10W
R503	1-216-017-91	RES, CHIP 47 5%	1/10W
R504	1-216-017-91	RES, CHIP 47 5%	1/10W
		< VARIABLE RESISTOR >	
RV501	1-225-925-11	RES, VAR 500/500 (PHONES LEVEL)	
*	A-6065-375-A	MB-85 BOARD, COMPLETE (CED, UK)	
*	A-6065-384-A	MB-85 BOARD, COMPLETE (HK, SP)	
*	A-6065-385-A	MB-85 BOARD, COMPLETE (AUS)	
*	A-6065-390-A	MB-85 BOARD, COMPLETE (E32)	
*	A-6065-414-A	MB-85 BOARD, COMPLETE (CN)	
		**********************	
		(Ref.No. 1,000 Series)	
		< CAPACITOR >	
C001	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C002	1-162-968-11	CERAMIC CHIP 0.0047uF 10%	50V
C003	1-126-246-11	ELECT CHIP 220uF 20%	4V
C004	1-126-204-11	ELECT CHIP 47uF 20%	16V
C005	1-126-206-11	ELECT CHIP 100uF 20%	6.3V
C007	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C008	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C010	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C011	1-125-822-11	TANTALUM 10uF 20%	10V
C012	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C013	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C015	1-126-246-11	ELECT CHIP 220uF 20%	4V
C016	1-125-822-11	TANTALUM 10uF 20%	10V
C017	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C018	1-125-822-11	TANTALUM 10uF 20%	10V

Ref. No.	Part No.	Description			Remark
C019	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C201	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C202	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C203	1-125-822-11	TANTALUM	10uF	20%	10V
C204	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C206	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C209	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C210	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C211	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C212	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C213	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C304	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C307	1-125-822-11	TANTALUM	10uF	20%	10V
C309	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C310	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C312	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C313	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C314	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C319	1-125-822-11	TANTALUM	10uF	20%	10V
C320	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C321	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C322	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C323	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C324	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C325	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C327	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C328	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C329	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C331	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C333	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C334	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C337	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C338	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C339	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C341	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C343	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C344	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C401	1-125-822-11	TANTALUM	10uF	20%	10V
C402	1-126-209-11	ELECT CHIP	100uF	20%	4V
C403	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C404	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C405	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C408	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C410	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C411	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-125-822-11	TANTALUM	10uF	20%	10V
C415	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C416	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C418	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C420	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C422	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C425	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C426	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C431	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C432	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C433	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C434	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C436	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C439	1-125-822-11	TANTALUM	10uF	20%	10V
C440	1-125-822-11	TANTALUM	10uF	20%	10V
C441	1-126-209-11	ELECT CHIP	100uF	20%	4V
C443	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C505	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C506	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C512	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C601	1-125-822-11	TANTALUM	10uF	20%	10V
C602	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C603	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C604	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C605	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C606	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C607	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C608	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C701	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C702	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C703	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C704	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C705	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C706	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C707	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C708	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C709	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C710	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C711	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C712	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C713	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C714	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C715	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C717	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C801	1-126-204-11	ELECT CHIP	47uF	20%	16V
C802	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C803	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C805	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C806	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C807	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C808	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C809	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C810	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C811	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C812	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C813	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C814	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C815	1-110-666-11	ELECT CHIP	22uF	20%	6.3V
C816	1-104-601-11	ELECT CHIP	10uF	20%	10V
C817	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C818	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C819	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C820	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C821	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C822	1-126-204-11	ELECT CHIP	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
C823	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C824	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C825	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C830	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C831	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C832	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C833	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C834	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C835	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C836	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C837	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C905	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C906	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C907	1-125-822-11	TANTALUM	10uF	20%	10V
C908	1-128-391-11	ELECT CHIP	330uF	20%	6.3V
C909	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C910	1-125-822-11	TANTALUM	10uF	20%	10V
C911	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C923	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C928	1-128-391-11	ELECT CHIP	330uF	20%	6.3V
C933	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C934	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C935	1-125-822-11	TANTALUM	10uF	20%	10V
C937	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C939	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C940	1-125-822-11	TANTALUM	10uF	20%	10V

< CONNECTOR >

Ref. No.	Part No.	Description
CN001	1-785-728-21	PIN (PC BOARD), CONNECTOR 7P
CN002	1-779-936-11	CONNECTOR, FFC/FPC 18P
CN003	1-779-936-11	CONNECTOR, FFC/FPC 18P
CN005	1-784-327-11	CONNECTOR, FFC/FPC 28P
CN006	1-774-767-11	CONNECTOR, FFC/FPC 15P
CN007	1-778-274-11	CONNECTOR, FFC/FPC 13P
* CN009	1-778-283-11	CONNECTOR, FFC/FPC 4P
CN010	1-573-806-21	PIN, CONNECTOR (1.5mm) (SMD) 6P
CN011	1-573-806-21	PIN, CONNECTOR (1.5mm) (SMD) 6P
* CN012	1-573-768-21	PIN, CONNECTOR (1.5mm) (SMD) 5P

< DIODE >

Ref. No.	Part No.	Description	
D701	8-719-988-61	DIODE	1SS355TE-17
D801	8-719-941-09	DIODE	DAP202UT106
D802	8-719-988-61	DIODE	1SS355TE-17
D803	8-719-941-09	DIODE	DAP202UT106
D804	8-719-941-86	DIODE	DAN202UT106
D805	8-719-941-86	DIODE	DAN202UT106
D806	8-719-988-61	DIODE	1SS355TE-17
D807	8-719-988-61	DIODE	1SS355TE-17

< FERRITE BEAD >

Ref. No.	Part No.	Description			Remark
FB001	1-469-324-21	FERRITE	0uH		
FB002	1-469-324-21	FERRITE	0uH		
FB003	1-469-324-21	FERRITE	0uH		
FB004	1-469-324-21	FERRITE	0uH		
FB005	1-469-324-21	FERRITE	0uH		
FB006	1-469-324-21	FERRITE	0uH		
FB007	1-469-324-21	FERRITE	0uH		
FB008	1-469-324-21	FERRITE	0uH		
FB014	1-469-116-21	FERRITE	0uH		
FB015	1-469-116-21	FERRITE	0uH		
FB016	1-216-801-11	METAL CHIP	22	5%	1/16W
FB017	1-469-116-21	FERRITE	0uH		
FB018	1-469-116-21	FERRITE	0uH		
FB019	1-469-116-21	FERRITE	0uH		
FB020	1-469-116-21	FERRITE	0uH		
FB021	1-469-116-21	FERRITE	0uH		
FB022	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB024	1-469-116-21	FERRITE	0uH		
FB026	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB028	1-469-116-21	FERRITE	0uH		
FB029	1-469-324-21	FERRITE	0uH		
FB030	1-469-116-21	FERRITE	0uH		
FB031	1-469-116-21	FERRITE	0uH		
FB032	1-469-116-21	FERRITE	0uH		
FB033	1-469-116-21	FERRITE	0uH		
FB035	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB037	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB040	1-469-116-21	FERRITE	0uH		
FB043	1-500-283-11	INDUCTOR CHIP	0uH		
FB047	1-469-116-21	FERRITE	0uH		
FB049	1-469-116-21	FERRITE	0uH		
FB051	1-469-116-21	FERRITE	0uH		
FB053	1-500-283-11	INDUCTOR CHIP	0uH		
FB054	1-500-283-11	INDUCTOR CHIP	0uH		
FB055	1-500-283-11	INDUCTOR CHIP	0uH		
FB056	1-500-283-11	INDUCTOR CHIP	0uH		
FB058	1-500-283-11	INDUCTOR CHIP	0uH		
FB060	1-500-283-11	INDUCTOR CHIP	0uH		
FB061	1-469-116-21	FERRITE	0uH		
FB063	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB065	1-469-116-21	FERRITE	0uH		
FB067	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB069	1-469-116-21	FERRITE	0uH		
FB071	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB073	1-469-116-21	FERRITE	0uH		
FB075	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB077	1-469-116-21	FERRITE	0uH		
FB078	1-216-801-11	METAL CHIP	22	5%	1/16W
FB080	1-216-801-11	METAL CHIP	22	5%	1/16W
FB081	1-216-801-11	METAL CHIP	22	5%	1/16W
FB083	1-216-801-11	METAL CHIP	22	5%	1/16W
FB084	1-216-801-11	METAL CHIP	22	5%	1/16W
FB085	1-216-801-11	METAL CHIP	22	5%	1/16W
FB087	1-216-801-11	METAL CHIP	22	5%	1/16W
FB088	1-216-801-11	METAL CHIP	22	5%	1/16W
FB090	1-469-116-21	FERRITE	0uH		
FB105	1-469-324-21	FERRITE	0uH		
FB106	1-469-324-21	FERRITE	0uH		

< FILTER >

Ref. No.	Part No.	Description
FL001	1-234-177-21	FILTER, CHIP EMI
FL002	1-234-177-21	FILTER, CHIP EMI
FL003	1-233-893-21	FILTER, CHIP EMI
FL004	1-233-893-21	FILTER, CHIP EMI
FL005	1-234-177-21	FILTER, CHIP EMI
FL006	1-234-177-21	FILTER, CHIP EMI
FL008	1-234-177-21	FILTER, CHIP EMI
FL009	1-234-177-21	FILTER, CHIP EMI
FL010	1-234-177-21	FILTER, CHIP EMI
FL014	1-234-177-21	FILTER, CHIP EMI

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Ref. No.	Part No.	Description	Remark
FL015	1-234-177-21	FILTER, CHIP EMI	
FL016	1-234-177-21	FILTER, CHIP EMI	
FL202	1-234-177-21	FILTER, CHIP EMI	
FL203	1-234-177-21	FILTER, CHIP EMI	
FL204	1-234-177-21	FILTER, CHIP EMI	
FL205	1-234-177-21	FILTER, CHIP EMI	
FL301	1-234-177-21	FILTER, CHIP EMI	
FL302	1-234-177-21	FILTER, CHIP EMI	
FL303	1-234-177-21	FILTER, CHIP EMI	
FL401	1-234-177-21	FILTER, CHIP EMI	
FL402	1-234-177-21	FILTER, CHIP EMI	
FL403	1-234-177-21	FILTER, CHIP EMI	
FL404	1-234-177-21	FILTER, CHIP EMI	
FL405	1-234-177-21	FILTER, CHIP EMI	
FL502	1-234-177-21	FILTER, CHIP EMI	
FL601	1-234-177-21	FILTER, CHIP EMI	
FL701	1-234-177-21	FILTER, CHIP EMI	
FL904	1-234-177-21	FILTER, CHIP EMI	
		< IC >	
IC001	8-759-594-91	IC SM8701AM-E2	
IC003	8-759-531-92	IC TC7WH04FU (TE12R)	
IC004	8-759-531-92	IC TC7WH04FU (TE12R)	
IC005	8-759-486-55	IC NJM2370U33-TE2	
IC201	8-759-469-25	IC AK6440AF-E2	
IC202	8-759-599-39	IC MB91101APFV-G-BND	
IC203	8-759-580-60	IC SN74AHCT08PWR	
IC204	8-759-573-65	IC IDT71V016S20PHAU-TL	
IC205	8-759-599-88	IC MBM29LV160B-290A-10 (HK, SP)	
IC205	8-759-599-89	IC MBM29LV160B-290B-10 (AUS, E32)	
IC206	8-759-644-27	IC MR27V1602D-27MAZ060 (CED, UK)	
IC206	8-759-672-21	IC MR27V1602D-A1MAZ060 (CN)	
IC207	8-759-427-92	IC PST9126NL	
IC302	8-759-486-55	IC NJM2370U33-TE2	
IC303	8-759-567-27	IC CXD8784R	
IC304	8-759-567-35	IC KM416V1200CT-L6T	
IC401	8-752-398-60	IC CXD1930BQ	
IC402	8-759-567-34	IC KM416S1020CT-G10T	
IC403	8-759-567-34	IC KM416S1020CT-G10T	
IC404	8-759-486-55	IC NJM2370U33-TE2	
IC501	8-752-400-43	IC CXD1901AR	
IC601	8-759-567-30	IC CXD8788Q	
IC701	8-759-598-87	IC CXD8791AQ	
IC702	8-759-337-40	IC NJM2904V (TE2)	
IC801	8-759-522-13	IC BA5981FP-E2	
IC802	8-759-567-26	IC BA5983FP-E2	
IC803	8-759-338-78	IC BA10324AFV-E2	
IC902	8-759-572-26	IC CXD8799N-T2	
IC904	8-759-052-52	IC BA178M05FP-E2	
IC907	8-759-572-26	IC CXD8799N-T2	
		< COIL >	
L001	1-414-754-11	INDUCTOR 10uH	
L402	1-414-754-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q801	8-729-015-74	TRANSISTOR UN5111-TX	
Q802	8-729-230-63	TRANSISTOR 2SD1819A-QRS-TX	
Q803	8-729-230-63	TRANSISTOR 2SD1819A-QRS-TX	

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R001	1-216-833-91	RES, CHIP	10K	5%	1/16W
R002	1-216-833-91	RES, CHIP	10K	5%	1/16W
R003	1-216-833-91	RES, CHIP	10K	5%	1/16W
R004	1-216-821-11	METAL CHIP	1K	5%	1/16W
R005	1-216-821-11	METAL CHIP	1K	5%	1/16W
R006	1-216-821-11	METAL CHIP	1K	5%	1/16W
R007	1-216-864-11	METAL CHIP	0	5%	1/16W
R009	1-216-864-11	METAL CHIP	0	5%	1/16W
R010	1-216-801-11	METAL CHIP	22	5%	1/16W
R011	1-216-864-11	METAL CHIP	0	5%	1/16W
R014	1-216-801-11	METAL CHIP	22	5%	1/16W
R030	1-216-821-11	METAL CHIP	1K	5%	1/16W
R035	1-216-833-91	RES, CHIP	10K	5%	1/16W
R036	1-216-821-11	METAL CHIP	1K	5%	1/16W
R037	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R044	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R045	1-216-833-91	RES, CHIP	10K	5%	1/16W
R053	1-216-833-91	RES, CHIP	10K	5%	1/16W
R202	1-216-801-11	METAL CHIP	22	5%	1/16W
R203	1-216-833-91	RES, CHIP	10K	5%	1/16W
R204	1-216-833-91	RES, CHIP	10K	5%	1/16W
R205	1-216-845-11	METAL CHIP	100K	5%	1/16W
R206	1-216-845-11	METAL CHIP	100K	5%	1/16W
R207	1-216-833-91	RES, CHIP	10K	5%	1/16W
R212	1-216-864-11	METAL CHIP	0	5%	1/16W
R213	1-216-801-11	METAL CHIP	22	5%	1/16W
R217	1-216-833-91	RES, CHIP	10K	5%	1/16W
R222	1-216-833-91	RES, CHIP	10K	5%	1/16W
R223	1-216-833-91	RES, CHIP	10K	5%	1/16W
R225	1-216-833-91	RES, CHIP	10K	5%	1/16W
R227	1-216-813-11	METAL CHIP	220	5%	1/16W
R228	1-216-813-11	METAL CHIP	220	5%	1/16W
R229	1-216-813-11	METAL CHIP	220	5%	1/16W
R230	1-216-813-11	METAL CHIP	220	5%	1/16W
R231	1-216-813-11	METAL CHIP	220	5%	1/16W
R232	1-216-813-11	METAL CHIP	220	5%	1/16W
R235	1-216-864-11	METAL CHIP	0	5%	1/16W
R237	1-216-224-91	RES, CHIP	12K	5%	1/8W (CN)
R237	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R237	1-216-238-91	RES, CHIP	47K	5%	1/8W (EXCEPT HK, SP, AUS, CN)
R237	1-216-246-00	RES, CHIP	100K	5%	1/8W (HK, SP)
R238	1-216-200-11	RES, CHIP	1.2K	5%	1/8W
R239	1-216-220-00	RES, CHIP	8.2K	5%	1/8W (CN)
R239	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R239	1-216-238-91	RES, CHIP	47K	5%	1/8W (HK, SP)
R239	1-216-246-00	RES, CHIP	100K	5%	1/8W (EXCEPT HK, SP, AUS, CN)
R240	1-216-224-91	RES, CHIP	12K	5%	1/8W (CN)
R240	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R240	1-216-238-91	RES, CHIP	47K	5%	1/8W (EXCEPT HK, SP, AUS, CN)

Ref. No.	Part No.	Description			Remark
R240	1-216-246-00	RES, CHIP	100K	5%	1/8W (HK, SP)
R241	1-216-200-11	RES, CHIP	1.2K	5%	1/8W
R305	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R306	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R307	1-218-883-11	METAL CHIP	33K	0.5%	1/16W
R308	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R309	1-216-838-11	METAL CHIP	27K	5%	1/16W
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R313	1-216-833-91	RES, CHIP	10K	5%	1/16W
R314	1-216-833-91	RES, CHIP	10K	5%	1/16W
R315	1-216-833-91	RES, CHIP	10K	5%	1/16W
R316	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R317	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R318	1-216-849-11	METAL CHIP	220K	5%	1/16W
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R320	1-218-853-11	METAL CHIP	1.8K	0.5%	1/16W
R321	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R322	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R323	1-216-833-91	RES, CHIP	10K	5%	1/16W
R324	1-216-833-91	RES, CHIP	10K	5%	1/16W
R325	1-216-833-91	RES, CHIP	10K	5%	1/16W
R326	1-216-833-91	RES, CHIP	10K	5%	1/16W
R327	1-216-833-91	RES, CHIP	10K	5%	1/16W
R328	1-216-833-91	RES, CHIP	10K	5%	1/16W
R329	1-216-833-91	RES, CHIP	10K	5%	1/16W
R330	1-216-833-91	RES, CHIP	10K	5%	1/16W
R331	1-216-833-91	RES, CHIP	10K	5%	1/16W
R332	1-216-833-91	RES, CHIP	10K	5%	1/16W
R337	1-216-809-11	METAL CHIP	100	5%	1/16W
R338	1-216-833-91	RES, CHIP	10K	5%	1/16W
R339	1-216-833-91	RES, CHIP	10K	5%	1/16W
R340	1-216-833-91	RES, CHIP	10K	5%	1/16W
R341	1-216-809-11	METAL CHIP	100	5%	1/16W
R403	1-216-833-91	RES, CHIP	10K	5%	1/16W
R404	1-216-864-11	METAL CHIP	0	5%	1/16W
R405	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R406	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R407	1-216-833-91	RES, CHIP	10K	5%	1/16W
R409	1-216-864-11	METAL CHIP	0	5%	1/16W
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W
R411	1-216-833-91	RES, CHIP	10K	5%	1/16W
R426	1-216-813-11	METAL CHIP	220	5%	1/16W
R427	1-216-813-11	METAL CHIP	220	5%	1/16W
R428	1-216-813-11	METAL CHIP	220	5%	1/16W
R429	1-216-813-11	METAL CHIP	220	5%	1/16W
R430	1-216-813-11	METAL CHIP	220	5%	1/16W
R431	1-216-813-11	METAL CHIP	220	5%	1/16W
R519	1-216-809-11	METAL CHIP	100	5%	1/16W
R520	1-216-833-91	RES, CHIP	10K	5%	1/16W
R521	1-216-833-91	RES, CHIP	10K	5%	1/16W
R522	1-216-833-91	RES, CHIP	10K	5%	1/16W
R527	1-216-833-91	RES, CHIP	10K	5%	1/16W
R528	1-216-833-91	RES, CHIP	10K	5%	1/16W
R530	1-216-864-11	METAL CHIP	0	5%	1/16W
R537	1-216-806-11	RES, CHIP	56	5%	1/16W
R539	1-216-864-11	METAL CHIP	0	5%	1/16W
R540	1-216-864-11	METAL CHIP	0	5%	1/16W
R541	1-216-864-11	METAL CHIP	0	5%	1/16W
R543	1-216-864-11	METAL CHIP	0	5%	1/16W
R544	1-216-864-11	METAL CHIP	0	5%	1/16W
R605	1-216-833-91	RES, CHIP	10K	5%	1/16W
R606	1-216-833-91	RES, CHIP	10K	5%	1/16W
R630	1-216-833-91	RES, CHIP	10K	5%	1/16W
R631	1-216-833-91	RES, CHIP	10K	5%	1/16W
R632	1-216-833-91	RES, CHIP	10K	5%	1/16W
R633	1-216-833-91	RES, CHIP	10K	5%	1/16W
R634	1-216-833-91	RES, CHIP	10K	5%	1/16W
R635	1-216-833-91	RES, CHIP	10K	5%	1/16W
R636	1-216-815-11	METAL CHIP	330	5%	1/16W
R637	1-216-809-11	METAL CHIP	100	5%	1/16W
R638	1-216-809-11	METAL CHIP	100	5%	1/16W
R639	1-216-809-11	METAL CHIP	100	5%	1/16W
R640	1-216-809-11	METAL CHIP	100	5%	1/16W
R641	1-216-809-11	METAL CHIP	100	5%	1/16W
R642	1-216-809-11	METAL CHIP	100	5%	1/16W
R643	1-216-815-11	METAL CHIP	330	5%	1/16W
R647	1-216-833-91	RES, CHIP	10K	5%	1/16W
R701	1-216-805-11	METAL CHIP	47	5%	1/16W
R702	1-216-817-11	METAL CHIP	470	5%	1/16W
R703	1-216-817-11	METAL CHIP	470	5%	1/16W
R704	1-216-817-11	METAL CHIP	470	5%	1/16W
R705	1-216-817-11	METAL CHIP	470	5%	1/16W
R706	1-216-821-11	METAL CHIP	1K	5%	1/16W
R707	1-216-844-11	METAL CHIP	82K	5%	1/16W
R708	1-216-844-11	METAL CHIP	82K	5%	1/16W
R709	1-216-844-11	METAL CHIP	82K	5%	1/16W
R710	1-216-844-11	METAL CHIP	82K	5%	1/16W
R711	1-216-833-91	RES, CHIP	10K	5%	1/16W
R712	1-216-839-11	METAL CHIP	33K	5%	1/16W
R720	1-216-821-11	METAL CHIP	1K	5%	1/16W
R721	1-216-821-11	METAL CHIP	1K	5%	1/16W
R722	1-216-801-11	METAL CHIP	22	5%	1/16W
R748	1-216-833-91	RES, CHIP	10K	5%	1/16W
R751	1-216-821-11	METAL CHIP	1K	5%	1/16W
R752	1-216-821-11	METAL CHIP	1K	5%	1/16W
R755	1-216-833-91	RES, CHIP	10K	5%	1/16W
R757	1-216-864-11	METAL CHIP	0	5%	1/16W
R758	1-216-864-11	METAL CHIP	0	5%	1/16W
R801	1-216-841-11	METAL CHIP	47K	5%	1/16W
R802	1-216-841-11	METAL CHIP	47K	5%	1/16W
R803	1-216-841-11	METAL CHIP	47K	5%	1/16W
R804	1-216-841-11	METAL CHIP	47K	5%	1/16W
R805	1-216-840-11	METAL CHIP	39K	5%	1/16W
R806	1-216-840-11	METAL CHIP	39K	5%	1/16W
R807	1-216-835-11	METAL CHIP	15K	5%	1/16W
R808	1-216-835-11	METAL CHIP	15K	5%	1/16W
R809	1-216-844-11	METAL CHIP	82K	5%	1/16W
R810	1-216-844-11	METAL CHIP	82K	5%	1/16W
R811	1-218-907-11	METAL CHIP	330K	0.5%	1/16W
R812	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R813	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R814	1-218-907-11	METAL CHIP	330K	0.5%	1/16W
R815	1-216-836-11	METAL CHIP	18K	5%	1/16W
R816	1-216-845-11	METAL CHIP	100K	5%	1/16W
R817	1-216-852-11	METAL CHIP	390K	5%	1/16W
R818	1-216-852-11	METAL CHIP	390K	5%	1/16W
R819	1-216-849-11	METAL CHIP	220K	5%	1/16W
R820	1-216-851-11	METAL CHIP	330K	5%	1/16W
R821	1-216-840-11	METAL CHIP	39K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R822	1-216-845-11	METAL CHIP	100K	5%	1/16W
R823	1-216-833-91	RES, CHIP	10K	5%	1/16W
R824	1-216-833-91	RES, CHIP	10K	5%	1/16W
R825	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R826	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R827	1-216-851-11	METAL CHIP	330K	5%	1/16W
R828	1-216-837-11	METAL CHIP	22K	5%	1/16W
R829	1-216-837-11	METAL CHIP	22K	5%	1/16W
R831	1-216-833-91	RES, CHIP	10K	5%	1/16W
R832	1-216-833-91	RES, CHIP	10K	5%	1/16W
R834	1-216-847-11	METAL CHIP	150K	5%	1/16W
R835	1-216-847-11	METAL CHIP	150K	5%	1/16W
R836	1-216-847-11	METAL CHIP	150K	5%	1/16W
R837	1-216-844-11	METAL CHIP	82K	5%	1/16W
R838	1-216-848-11	METAL CHIP	180K	5%	1/16W
R839	1-216-848-11	METAL CHIP	180K	5%	1/16W
R840	1-216-848-11	METAL CHIP	180K	5%	1/16W
R841	1-216-843-11	METAL CHIP	68K	5%	1/16W
R842	1-216-844-11	METAL CHIP	82K	5%	1/16W
R843	1-216-844-11	METAL CHIP	82K	5%	1/16W
R844	1-216-843-11	METAL CHIP	68K	5%	1/16W
R845	1-216-843-11	METAL CHIP	68K	5%	1/16W
R846	1-216-841-11	METAL CHIP	47K	5%	1/16W
R847	1-216-296-91	SHORT	0		
R851	1-216-833-91	RES, CHIP	10K	5%	1/16W
R852	1-216-833-91	RES, CHIP	10K	5%	1/16W
R853	1-216-833-91	RES, CHIP	10K	5%	1/16W
R854	1-216-833-91	RES, CHIP	10K	5%	1/16W
R855	1-216-834-11	METAL CHIP	12K	5%	1/16W
R856	1-216-836-11	METAL CHIP	18K	5%	1/16W
R857	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R858	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R859	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R860	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R861	1-216-296-91	SHORT	0		
R864	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R865	1-216-833-91	RES, CHIP	10K	5%	1/16W
R866	1-216-833-91	RES, CHIP	10K	5%	1/16W
R867	1-216-833-91	RES, CHIP	10K	5%	1/16W
R868	1-216-833-91	RES, CHIP	10K	5%	1/16W
R869	1-216-833-91	RES, CHIP	10K	5%	1/16W
R870	1-216-815-11	METAL CHIP	330	5%	1/16W
R871	1-216-817-11	METAL CHIP	470	5%	1/16W
R872	1-216-815-11	METAL CHIP	330	5%	1/16W
R873	1-216-821-11	METAL CHIP	1K	5%	1/16W
R915	1-216-809-11	METAL CHIP	100	5%	1/16W
R918	1-216-809-11	METAL CHIP	100	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
* RB201	1-233-270-11	NETWORK, RES (8 GANG)		10K	
* RB202	1-233-270-11	NETWORK, RES (8 GANG)		10K	
* RB203	1-233-270-11	NETWORK, RES (8 GANG)		10K	
* RB204	1-233-270-11	NETWORK, RES (8 GANG)		10K	
* RB402	1-233-270-11	NETWORK, RES (8 GANG)		10K	
* RB601	1-233-270-11	NETWORK, RES (8 GANG)		10K	
		< VARIABLE RESISTOR >			
RV401	1-223-583-11	RES, ADJ, CARBON		1K	

Ref. No.	Part No.	Description			Remark
		< VIBRATOR >			
X001	1-781-188-21	OSCILLATOR, CRYSTAL (27MHz)			
X201	1-781-185-21	VIBRATOR, CERAMIC (12.5MHz)			

SW-332 BOARD
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(Ref.No. 2,000 Series)

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CN101	1-793-579-21	CONNECTOR, FPC			
* CN102	1-770-619-11	PIN, CONNECTOR 2P			
		< DIODE >			
D101	8-719-988-61	DIODE 1SS355TE-17			
		< SWITCH >			
S101	1-762-594-61	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)			
S102	1-572-688-11	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)			
S103	1-572-688-11	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)			

* A-6065-381-A TK-55 BOARD, COMPLETE
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(Ref.No. 2,000 Series)

Ref. No.	Part No.	Description			Remark
		< CAPACITOR >			
C001	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C002	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C004	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C005	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C006	1-124-779-00	ELECT CHIP	10uF	20%	16V
C007	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C008	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C009	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C010	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C011	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C012	1-124-779-00	ELECT CHIP	10uF	20%	16V
C013	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C014	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C015	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C016	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C017	1-164-172-11	CERAMIC CHIP	0.0056uF	10%	25V
C018	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C019	1-164-172-11	CERAMIC CHIP	0.0056uF	10%	25V
C020	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C021	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C022	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C023	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C024	1-164-730-11	CERAMIC CHIP	0.0012uF	10%	50V
C025	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C026	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C027	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C028	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C029	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C030	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C031	1-124-779-00	ELECT CHIP	10uF	20%	16V
C032	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C033	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C034	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C035	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V

Ref. No.	Part No.	Description	Remark
C036	1-165-176-11	CERAMIC CHIP 0.047uF 10%	16V
C037	1-164-739-11	CERAMIC CHIP 560PF 5%	50V
C038	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V
C039	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V
C040	1-162-969-11	CERAMIC CHIP 0.0068uF 10%	25V
C041	1-162-966-11	CERAMIC CHIP 0.0022uF 10%	50V
C044	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V
C045	1-107-826-91	CERAMIC CHIP 0.1uF 10%	16V
		< CONNECTOR >	
CN001	1-785-700-21	CONNECTOR, FPC (ZIF) 23P	
CN002	1-566-529-11	CONNECTOR, FPC (ZIF) 13P	
CN003	1-785-699-21	CONNECTOR, FFC/FPC 18P	
CN004	1-785-699-21	CONNECTOR, FFC/FPC 18P	
* CN005	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
* CN006	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
* CN007	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
		< DIODE >	
D003	8-719-988-61	DIODE 1SS355TE-17	
		< IC >	
IC001	8-759-567-24	IC SSI33P3722	
		< COIL >	
L001	1-412-031-11	INDUCTOR CHIP 47uH	
		< TRANSISTOR >	
Q001	8-729-903-46	TRANSISTOR 2SB1132-T100-QR	
Q002	8-729-015-76	TRANSISTOR UN5211-TX	
		< RESISTOR >	
R001	1-216-815-11	METAL CHIP 330 5%	1/16W
R002	1-216-809-11	METAL CHIP 100 5%	1/16W
R003	1-216-809-11	METAL CHIP 100 5%	1/16W
R004	1-216-837-11	METAL CHIP 22K 5%	1/16W
R005	1-216-013-00	METAL CHIP 33 5%	1/10W
R006	1-216-013-00	METAL CHIP 33 5%	1/10W
R007	1-216-841-11	METAL CHIP 47K 5%	1/16W
R008	1-216-797-11	METAL CHIP 10 5%	1/16W
R009	1-216-834-11	METAL CHIP 12K 5%	1/16W
R010	1-216-833-91	RES, CHIP 10K 5%	1/16W
R012	1-216-864-11	METAL CHIP 0 5%	1/16W
R014	1-216-864-11	METAL CHIP 0 5%	1/16W
R015	1-216-833-91	RES, CHIP 10K 5%	1/16W
R016	1-216-833-91	RES, CHIP 10K 5%	1/16W
R017	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R018	1-216-833-91	RES, CHIP 10K 5%	1/16W
R022	1-216-811-11	METAL CHIP 150 5%	1/16W
R023	1-216-820-11	METAL CHIP 820 5%	1/16W
R025	1-216-813-11	METAL CHIP 220 5%	1/16W
R026	1-216-864-11	METAL CHIP 0 5%	1/16W
R029	1-216-861-11	METAL CHIP 2.2M 5%	1/16W

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS **************	
52	1-791-670-11	CABLE, FLEXIBLE FLAT (FMT-27)	
54	1-791-668-11	CABLE, FLEXIBLE FLAT (FMA-17)	
55	1-791-669-11	CABLE, FLEXIBLE FLAT (FMA-18)	
57	1-791-672-11	CABLE, FLEXIBLE FLAT (FMS-12)	
59	1-791-671-11	CABLE, FLEXIBLE FLAT (FMF-38)	
66	1-543-950-11	CORE, FERRITE	
167	1-960-020-11	HARNESS (ST-117)	
M001	A-6062-252-A	MOTOR ASSY, LD (LOADING)	
S001	1-570-771-21	SWITCH (CHUCK SENSOR)	

ACCESSORIES & PACKING MATERIALS
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Ref. No.	Part No.	Description
	1-418-508-21	COMMANDER, STANDARD (RMT-D109O/S) (EXCEPT HK, SP, CN)
	1-418-508-31	COMMANDER, STANDARD (RMT-D109E/S) (HK, SP, CN)
⚠	1-418-676-11	ADAPTOR, AC
	1-575-334-11	CORD, CONNECTION (STEREO AV CABLE 1.5m)
	1-575-335-21	CORD, CONNECTION (S-VIDEO CABLE 1.5m)
⚠	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK, HK)
⚠	1-791-638-11	CORD, POWER (EXCEPT AUS, CH)
⚠	1-791-667-11	CORD, POWER (AUS)
⚠	1-791-937-11	CORD, POWER (CH)
⚠	1-793-669-11	ADAPTOR, CONVERSION (CED, E32, UK)
	3-053-633-01	COVER, BATTERY(for RMT-D109O/S, D109E/S)
	3-058-025-01	SCREW, COIN
	3-867-780-11	MANUAL, INSTRUCTION (ENGLISH) (CED, E32, UK, AUS)
	3-867-780-21	MANUAL, INSTRUCTION (FRENCH, GERMAN) (CED, E32)
	3-867-780-31	MANUAL, INSTRUCTION (ITALIAN, DUTCH) (CED, E32)
	3-867-780-41	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE) (CED)
	3-867-780-51	MANUAL, INSTRUCTION (DANISH, FINNISH) (CED)
	3-867-780-61	MANUAL, INSTRUCTION (SWEDISH, NORWEGIAN) (CED)
	3-867-788-11	MANUAL, INSTRUCTION (ENGLISH) (HK, SP, CN)
	3-867-788-21	MANUAL, INSTRUCTION (CHINESE) (HK)
	3-867-788-31	MANUAL, INSTRUCTION (CHINESE) (SP, CN)
	X-3949-959-2	STAND ASSY

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-921-740-12

Sony Corporation
Home Video Division Company

2000A0530038-1F
Printed in Japan © 2000. 1
Published by Quality Assurance Dept.